

PUBLIC HEALTH REPORTS

In this issue



U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service



Electron Microscope

and the Golgi substance

see overleaf

PUBLIC HEALTH REPORTS

Published since 1878

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The Electron Microscope and the Golgi Substance

Proof that an organized structure called the Golgi substance may be visualized inside the living cells of animals was found with the help of the electron microscope. Study of the substance may add fundamental knowledge of the makeup of cancer cells.

The first to describe this substance was Camillo Golgi, an Italian neurologist, who in 1898 discovered it in nerve cells of the barn owl and called it the "internal reticular apparatus." Since that time scientists interested in the structure and function of cells have done many experiments in unsuccessful attempts to isolate the Golgi substance or to prove its existence. Investigators using the classical methods of staining with osmic acid and silver have identified the substance in numerous multicellular organisms, observing it in functioning resting cells but not in dividing cells. It has not been identified in viruses, bacteria, or single-celled animals such as protozoa.

In recent years the reality of the substance has been the subject of controversy since it had not been satisfactorily demonstrated in living body cells. Now that Public Health Service cytologists of the National Cancer Institute have demonstrated the Golgi substance in the living state, more can be learned about its functions and chemical nature. Chemical analyses of the substance in normal and in

cancer cells have been started by these scientists at the National Institutes of Health.

The Golgi substance was identified in fresh unstained body cells isolated from mice and rats. It was then photographed in the living state for the first time. After identification, the substance was isolated by high-speed centrifugation.

In photographs of isolated cells magnified several thousand times, the Golgi substance appeared as dark strands forming a cylindrical network in the cytoplasm between the nucleus and the outside border of the cell.

The presence of the substance with a characteristic position and distribution is evidence for the view that it plays some important role in the life of the cell. The most generally accepted theory on the function of the substance is that it serves as an area for the segregation and accumulation of secretory and excretory products of the cell.

Study of the Golgi substance may introduce new criteria useful in distinguishing a malignant cell from a normal one. Distinct differences between the substance in normal and in malignant human tissues have been observed.

The electron microscope will continue its usefulness in the future research on the Golgi substance.

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Published concurrently with this issue:

PUBLIC HEALTH MONOGRAPH No. 21 . . . Why some sanitary engineers leave the field.

Irwin M. Rosenstock and Arthur P. Miller.

26 pages; illustrations. A summary and information on availability appear on pages 865-866.



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an estimate

TUBERCULOSIS EXPENDITURES

in FISCAL 1952

for the United States and Territories

By JOSEPH N. GITLIN

IN THOUSANDS OF DOLLARS

	TOTAL	Hospitalization and rehabilitation	Compensation	Construction	Research	Control	Other
TOTAL	\$621,023	\$332,672	\$189,254	\$37,725	\$4,396	\$53,855	\$3,121
Federal Government	307,012	108,657	175,174	9,034	1,281	12,866	—
(Public Health Service)	(16,904)	(2,295)	(—)	(5,044)	(1,151)	(8,413)	(—)
State and local government	259,204	195,284	13,666	25,008	178	25,069	—
Nongovernmental	54,807	28,731	414	3,683	2,938	15,921	3,121

FROM THE ECONOMIC viewpoint, the total cost of any disease causing death and disability may be divided into the following three general areas:

Cash outlays during a given period for all items attributable to the disease.

Mr. Gitlin, a health program adviser since July 1951 with the Chronic Disease and Tuberculosis Program, Division of Special Health Services, Public Health Service, is on temporary duty with the Air Force. He is presently assigned to the Air University, Gunter Air Force Base, Montgomery, Ala.

Loss of income—or its precursor and corollary, loss of production—during a given period, resulting from illness or from disability caused by the disease.

Loss of potential future earnings during a given period because of death from the disease before the expected age of retirement.

This report—a result of a Public Health Service study initiated with the hope of arriving at the total cost of tuberculosis in the United States and its Territories—is concerned only with the first of the three general areas listed above: cash outlays during a given period for all items attributable to the disease for which data are available.

These estimates of tuberculosis expenditures are based on reports submitted to the Public Health Service by other Federal agencies and by State and local governments; and on reports from the National Tuberculosis Association and on a variety of other available material. In order to conform to the reporting system followed by most of the agencies submitting reports, the Federal fiscal year 1952 rather than the calendar year 1952 has been used as the time period for which expenditures are shown.

Results of the Study

During the 12 months beginning July 1, 1951, and ending June 30, 1952, it is estimated that the following amounts were spent in the United States and its Territories as a result of tuberculosis and to prevent or control the effect of the disease:

Federal Government—\$307 million, of which \$17 million was administered by the Public Health Service.

State and local governments—\$259 million.

Nongovernmental agencies—\$55 million.

The resulting total of \$621 million is believed to represent a very conservative estimate of actual expenditures for tuberculosis. This is so partly because of the exclusion of tuberculosis expenditures in State and local mental and penal institutions, but primarily because of the exclusion of expenditures by individuals with tuberculosis for medical care by private physicians outside hospitals and sanatoriums. In terms of magnitude, this second item could be the most important exclusion with respect to cash outlays. Not to be overlooked, too, as a sizable item of exclusion, is the cost of administration. Although the costs of administration were included in the figures reported for some of the programs, such as those of the States, for the most part it can be assumed that these figures have been generally excluded except where specifically indicated.

In the accompanying tabulation, reports from the following Federal agencies were incorporated under the subcategory "Federal Government": the Departments of Agriculture, the Army, the Navy, and State (United States Foreign Service); the Public Health Service and

the Veterans Administration; the Bureaus of Employees' Compensation, Indian Affairs, Prisons, and Public Assistance; the Office of Vocational Rehabilitation; and Freedman's Hospital and St. Elizabeths Hospital—both Federal hospitals.

Included under the subcategory "State and local government" is the expenditure of non-Federal public funds by such agencies as health departments, State boards of control, special tuberculosis commissions, welfare departments, and public hospitals which are independent of other agencies.

The nongovernmental subcategory includes, among others, the following agencies reporting—or reported to have—expenditures attributable to tuberculosis: the National Tuberculosis Association and its affiliates throughout the country, nongovernmental hospitals, private foundations, universities and colleges, and manufacturing firms.

In the tabulation, addends may not sum to totals because of rounding. Definitions of the categorical terms used and a discussion of the data included and excluded from the specific categories and subcategories follow.

Hospitalization and Rehabilitation

Under the heading "Hospitalization and Rehabilitation" are included estimated expenditures for (a) hospital care of persons with tuberculosis, (b) services provided for persons with tuberculosis by outpatient departments of hospitals, and (c) rehabilitation of tuberculosis patients. In this category, rehabilitation of tuberculosis patients has been combined with tuberculosis hospitalization because many of the reports submitted did not show tuberculosis rehabilitation separately. This is probably owing to the fact that in recent years it has been the policy of many hospitals to institute tuberculosis rehabilitation as an integral part of the tuberculosis patient care. The total figure includes about \$6 million specifically identified as expenditures for rehabilitation.

The *Federal Government* portion of this category comprises estimated expenditures, as reported by 11 Federal agencies, for (a) tuberculosis hospitalization, (b) tuberculosis outpatient service, and (c) tuberculosis rehabili-

tation. The figure is composed largely of hospital care of tuberculosis patients in Federal institutions. However, it also includes payments made by Federal agencies to non-Federal hospitals and sanatoriums for the care of Federal beneficiaries with tuberculosis. Of the Federal Government total, approximately \$2.3 million was administered by the Public Health Service.

The State and local government portion of this category is based primarily on the number of tuberculosis beds occupied in State and local government hospitals and sanatoriums as of January 1, 1952, and the average cost per patient-day for non-Federal Government tuberculosis hospitals.

The number of beds occupied was obtained from questionnaire returns in an annual Public Health Service survey of tuberculosis beds in hospitals and sanatoriums.

The cost per patient-day was obtained from data on 1952 national hospital finances published in the administrative guide section, part 2 of the June 1953 issue of *Hospitals* (vol. 27, table 5, p. 24), the journal of the American Hospital Association.

The State portion of this estimate has been substantiated by data collected for another purpose by the Public Health Service. (Reference is made to the study, "Distribution of Health Services in the Structure of State Government, 1950," by Aaron W. Christensen, Evelyn Flook, and Georgia B. Druzina—Public Health Service Publication No. 184, part 3, table 5, p. 144). The States' share of the cost of financing vocational rehabilitation for the tuberculous is also included here.

The nongovernmental figure is based primarily on the number of tuberculosis beds occupied in nongovernmental hospitals and sanatoriums as of January 1, 1952, and the average cost per patient-day in nongovernmental tuberculosis hospitals. The data used are from the same sources for State and local government figures noted in the preceding section. Also included are nongovernmental tuberculosis rehabilitation expenditures for which data were available.

Primarily because of the exclusion of expenditures attributable to tuberculosis in State and local mental and penal institutions, the total

for the category "Hospitalization and Rehabilitation" is probably an underestimate, as previously noted. The figure 25,000 is the most recent (1952) and authoritative estimate of the number of persons hospitalized with tuberculosis in State and local mental and penal institutions in the United States and Territories. No data are available showing the increment in the costs of caring for these people because they have tuberculosis.

Expenditures by some foundations for the rehabilitation of tuberculosis patients have also been excluded because the data were not available.

Since there is a great deal of reimbursement of funds among various agencies for tuberculosis hospital care, it was necessary to adjust several of the reported figures. Most of these adjustments resulted merely in the transfer of amounts from one subcategory to another. For example: The amount for tuberculosis hospitalization reported by Freedmen's Hospital, a Federal agency under the Department of Health, Education, and Welfare, included reimbursements made to Freedmen's Hospital by the District of Columbia. The amount of reimbursement was added to the State and local total and subtracted from the Federal total. Similarly, payments to municipal hospitals for tuberculosis hospitalization reported by the Veterans Administration were subtracted from the State and local total in order to avoid duplication.

Compensation

The "Compensation" category includes reported payments to individuals or to their relatives or dependents because of death or disability caused by tuberculosis. Also included is \$750,000 which was paid by governmental agencies to farmers for the destruction of tuberculous livestock, even though the argument has been advanced that payments to farmers for the destruction of tuberculous livestock are made to enlist their cooperation in tuberculin testing programs designed to prevent the spread of tuberculosis to humans, and that for this reason these payments should be considered as control expenditures. While the inclusion of such payments here is admittedly

arbitrary, it is felt that for the purposes of this study they more nearly conform to the definition of compensation than to the definition of control.

The question of including under this category insurance payments resulting from death or disability as a result of tuberculosis has been considered. In the instance of death benefits paid on insured individuals, it was strongly felt that, because of the prepayments by the individuals themselves, the funds were not directly attributable to tuberculosis as a cost because they are analogous to a "savings plan." In the instance of health and accident insurance programs, it was found that generally a long-term illness such as tuberculosis is specifically excluded from health and accident policies as a compensable condition.

The Federal Government portion of this category consists largely of payments made by the Veterans Administration to veterans disabled because of tuberculosis and to dependents of veterans who have died of tuberculosis. Also included here are payments because of tuberculosis under the Social Security Administration's Bureau of Public Assistance programs of "aid to dependent children" and "aid to the permanently and totally disabled," and payments made because of tuberculosis by the Bureau of Employees' Compensation in the Department of Labor, and Federal moneys used to compensate farmers for the destruction of tuberculous livestock.

The State and local government portion of this category is composed of estimated amounts attributable to tuberculosis contributed by State and local governments in the State programs termed "aid to dependent children," "aid to the totally and permanently disabled," and "general assistance," and as compensation to farmers for the destruction of tuberculous livestock. Amounts paid to individuals under State temporary disability programs have not been included because they are in principle comparable to insurance plans.

The nongovernmental amount reflects the total of amounts reported by nongovernmental agencies spent primarily for emergency relief to individuals because of tuberculosis.

The \$189,254,000 total for "Compensation" is probably somewhat underestimated because

of the exclusion of payments made as compensation for tuberculosis by the Bureau of Indian Affairs in the Department of the Interior, and by the Children's Bureau in the Social Security Administration. Although both bureaus recognize that substantial compensatory payments are made as a result of tuberculosis, no basis could be found upon which to estimate accurately that part of the total compensatory payments specifically attributable to tuberculosis.

The inclusion of amounts paid to workers from workmen's compensation plans, which are generally employer-supported programs, has also been considered for this category, but when it was found that the number of cases of tuberculosis resulting from occupational conditions was insignificant, compared to the total number of persons disabled by tuberculosis, the amount of these compensatory payments was omitted.

Construction

The category headed "Construction" includes the estimated value, during the fiscal year 1952, of hospital construction which was intended to facilitate the care and treatment of persons with tuberculosis. Although this includes, for the most part, the building of tuberculosis hospital beds, it also includes additions to, and improvements in, existing tuberculosis facilities. The purchase of hospital equipment used primarily for the care and treatment of persons with tuberculosis is also included.

The Federal Government portion of the total comprises estimates of the amounts expended by reporting Federal agencies for the construction of tuberculosis hospital facilities, including \$5 million administered by the Public Health Service under the Hill-Burton program (Hospital Survey and Construction Act, Public Law 725, 79th Cong., 2d sess.).

The State and local government portion represents the estimated value of tuberculosis hospital construction by State and local governments including the estimated State and local share contributed to the Hill-Burton program.

The nongovernmental portion of the total is the estimated value of tuberculosis hospital construction by nongovernmental agencies including the nongovernmental share contributed to the Hill-Burton program.

Construction estimates are based primarily on a table prepared by the Public Health Service, showing the value in current (1952) prices of hospital construction in 1952, and on a table showing the distribution of non-Federal hospital construction during 1950 by type of facility; this table appears in the article entitled, "Hospital Construction Trends" by Louis S. Reed in *Modern Hospital*, March 1952 (vol. 7, pp. 72-76, table 5). The precision of the estimates is dependent, therefore, on the applicability of the 1950 distribution to 1952. Data available indicate that there had been no appreciable change in the percentage representing the value of non-Federal tuberculosis hospital construction compared with the value of total non-Federal hospital construction. In view of the fact that the number of new tuberculosis beds constructed has been decreasing in relation to total beds constructed, it is probable that there has been an increase in expenditures for the construction of additions to, and the making of improvements in, existing tuberculosis facilities and the purchase of new tuberculosis hospital equipment.

Amounts for Research

The "Research" category includes all reported expenditures for tuberculosis research, covering such basic or fundamental research as scientific analysis, exploration, and experimentation. It also includes applied research, an example of which is the cooperative applied tuberculosis research engaged in by the Public Health Service. Not included here are expenditures on operational research, which is pertinent to the development and analysis of tuberculosis control programs. This type of research conforms more closely to the meaning of "Control," and such expenditures have, therefore, been included under that heading.

The *Federal Government* subcategory comprises estimated expenditures reported by Federal agencies engaged in, or supporting, tuberculosis research, including Public Health Service expenditures for both direct research and for grants to universities and for research grants, fellowships, and traineeships to individuals who perform much of the basic tuberculosis research in the United States.

The State and local government expenditure is the total of amounts specifically identified by State, county, and municipal health departments as having been spent on tuberculosis research.

The nongovernmental expenditure is the total of amounts reported as having been spent on tuberculosis research by manufacturing firms, foundations, voluntary health agencies, and universities.

Both the State and local government and nongovernmental subtotals were obtained from an article by Virginia Cameron entitled "The Cost of Research in Tuberculosis in the United States," published in *The American Review of Tuberculosis* (vol. 60, pp. 393-405, October 1949). In this report, considered to be the most recent and authoritative on the cost of tuberculosis research, Cameron analyzes allocations for tuberculosis research in 1947-48. This analysis has been used as a basis for the estimates of 1952 expenditures since, in recent years, the level of tuberculosis research by State and local health departments and nongovernmental agencies has been largely influenced by the investigation of chemotherapeutic agents. In this connection, it is believed that the investigation of isoniazid in 1952 exerted about the same influence on tuberculosis research as the investigation of streptomycin did in 1947-48.

It is recognized that a considerable amount of tuberculosis research is conducted in hospitals and sanatoriums—especially State and local—the cost of which is usually absorbed in the total cost of hospitalization without being specifically identified. For this reason, the total for "Research" is probably somewhat understated, while the total for "Hospitalization and Rehabilitation" is correspondingly overstated by an unknown amount.

The "Control" Column

Included under "Control" are estimated expenditures attributable to tuberculosis for the provision of such services as case finding, diagnostic and treatment clinics, public health nursing facilities, laboratory facilities, operational research studies, health education, training programs, case register systems, and administration.

The Federal Government subtotal comprises estimated amounts spent for control by reporting Federal agencies, including the Departments of Agriculture, the Army, and the Navy; the Veterans Administration, and the Bureau of Indian Affairs of the Department of the Interior. It also includes about \$8.4 million administered by the Public Health Service, of which grants to the States is the largest single item.

The State and local government amount is the sum of specific allocations for control reported by State and local government agencies plus the estimated portion of State and local government allocations for general health services that were used for tuberculosis control. Reported State and local expenditures for the administration of bovine and avian tuberculosis control have also been included.

The nongovernmental figure is the total of amounts reported by voluntary health agencies for such items as case finding, health education, program development, maintenance of clinical and nursing facilities, and administration. This subtotal is considerably underestimated because of a lack of data on which to base an estimate of tuberculosis control expenditures by universities, other schools, and manufacturing firms.

The amount of understatement in the "Control" total is increased by the exclusion of amounts spent for education in tuberculosis in

medical and nursing schools, for X-ray technician courses, and for other academic training received by persons engaged in the field of health. It was not possible to estimate an amount covering these expenditures because of a lack of available data on this subject.

The "Other" Category

The category called "Other" comprises amounts reported by nongovernmental agencies for such items as business management, tuberculosis fund-raising activities, as well as amounts included under the category of "Miscellaneous" in their reports to the Public Health Service.

Two additional areas of expenditures might theoretically have been included here as attributable to tuberculosis. They are the cost of supplying various types of insurance involving tuberculosis and the cost of collecting taxes which are used in part for tuberculosis control. Neither of these areas was included because of a lack of data concerning the distribution of total costs over the many diseases involved, the services provided, and the functions served. It has been argued that a part of such costs cannot validly be attributed to tuberculosis since, if tuberculosis were eliminated, the cost of providing insurance and of collecting taxes would not be affected.

Legal Note on Fluoridation Cases

The supreme courts of two States—Louisiana and Oklahoma—have recently upheld programs for the fluoridation of municipal water supplies as valid exercises of the police power and involving no unconstitutional invasion of personal liberty—*Chapman v. City of Shreveport*, Shreveport Times, June 3, 1954 (La. Sup. Ct. May 31, 1954); *Dowell v. City of Tulsa*, 23 U.S. L. WEEK 2007, XXV OKLA. BAR J. 116 (Sup. Ct. June 15, 1954).

The United States Supreme Court in June 1954 denied review (347 U.S. 1012, 74 S. Ct. 863) in the California fluoridation case, *De Aryan v. Butler*, 119 Cal. App. 2d 674, 260 Pac. 2d 98 (1953).

Chemical Control of Rice Field Mosquitoes In Mississippi

By WILLIS MATHIS, B.S., VINCENT B. PICKETT, B.S., and W. O. MILLER, B.S.

THE INTRODUCTION and rapid expansion of rice culture in Mississippi during 1950-51 created a serious pest mosquito problem in the counties concerned. The intense mosquito annoyance suffered by communities in the rice-growing areas led the Mississippi State Board of Health to request aid from the Communicable Disease Center of the Public Health Service in developing an effective method of controlling rice field mosquitoes. As a result, a field station was established for that purpose at Cleveland, Miss., in 1952. The data reported relate to the work conducted during 1952 and 1953. All investigations were conducted in Bolivar County, Miss., which contains more than half of the entire rice acreage in the State.

Mr. Mathis, entomologist, and Mr. Pickett, sanitary engineer, are stationed in Savannah, Ga., at the Technical Development Laboratories of the Public Health Service's Communicable Disease Center. Mr. Miller is a sanitary engineer with the Mississippi Board of Health. All three are temporarily assigned to the field project at Cleveland, Miss., in which the Bolivar County (Miss.) Health Department is also cooperating.

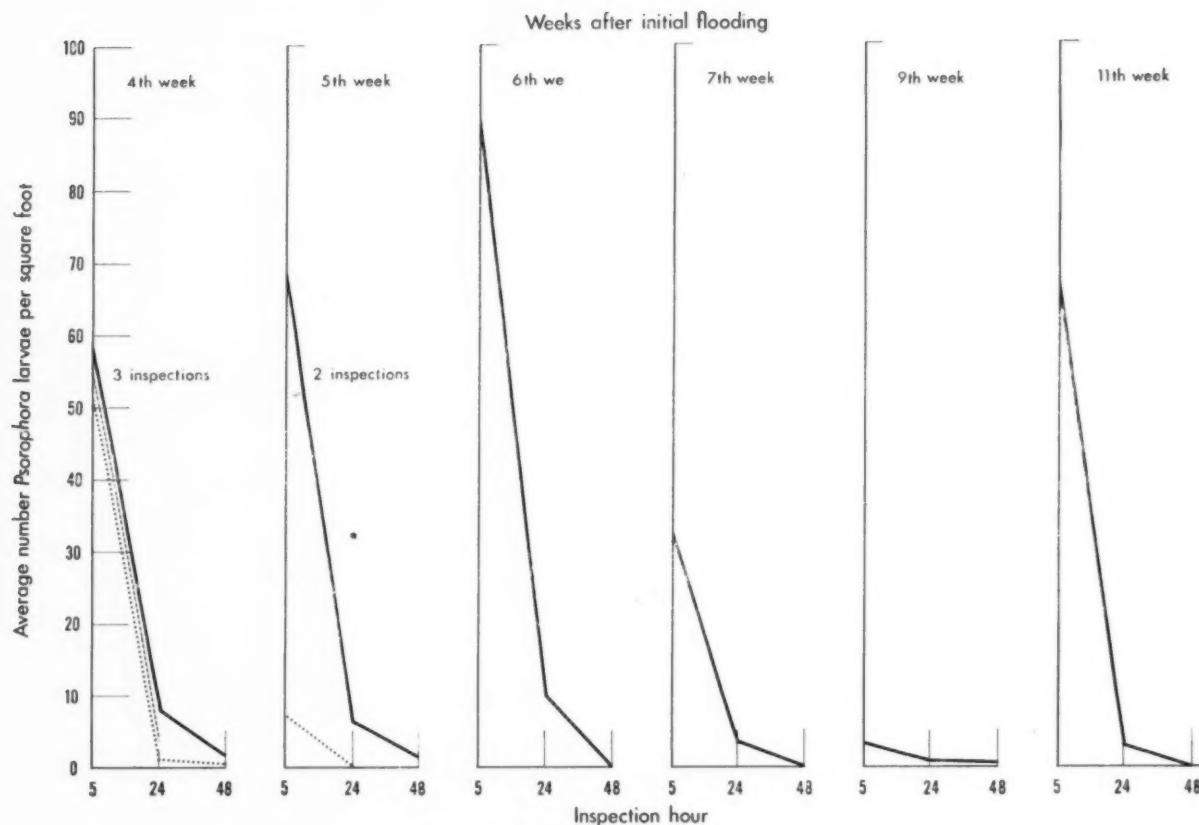
This paper was read to the public health biology section at the Southern Branch meeting of the American Public Health Association, April 21-23, 1954, at St. Petersburg, Fla. News summaries of other papers heard at the meeting are presented in this issue of *Public Health Reports* beginning on p. 841.

Several different species of mosquitoes breed in the rice fields of Mississippi, but *Psorophora confinnis* (Lynch-Arribalzaga) is the most important pest species. The eggs of this mosquito are deposited on moist soil. After a few days of embryonic development, they are capable of hatching within a few minutes when submerged in water (1, 2). The immature stages of *P. confinnis* complete development in approximately 7 days, thus permitting a rapid buildup of the adult population under favorable conditions such as those found in rice growing areas.

In rice farming, the growers usually flood their fields throughout May and June and maintain the water levels for periods of from 4 to 6 weeks. After this time, the fields are dewatered and allowed to dry, a procedure adopted principally for the abatement of the rice water weevil, *Lissorhoptrus simplex* (Say). After the drying out period, the fields are reflooded and usually remain flooded until the grain is harvested. This cycle of water management, together with the drainage and reflooding of the fields for other cultural purposes or because of water loss through defective dikes, is conducive to heavy production of adult *P. confinnis* in the June-July period.

As the practice of dewatering the fields for control of the rice water weevil is responsible for a major part of the *Psorophora* production, and since the static inundation practices favorable for reduction of rice field mosquito breeding augment rice water weevil production, the integral interrelationship of the two problems

Figure 1. Effects on prevalence of *Psorophora* larvae of a preflood treatment of a 101-acre rice field near Cleveland, Miss., with dieldrin emulsion applied at the rate of 1 pound of dieldrin per acre. Ten 1-foot square samples were taken in each inspection.



is obvious. Consequently, in these studies of chemical treatments for rice field mosquito control, incidental observations also were made on their effect upon the prevalence of the rice water weevil.

Treatment and Sampling Procedures

In 1952, 5 plots of approximately 10 acres each received a preflood treatment of a 1 percent dieldrin emulsion at a rate of 1 pound of dieldrin per acre. A similar series of plots was treated with a 3 percent DDT emulsion applied at the rate of 3 pounds of DDT per acre. Four additional plots aggregating 100 acres were given postflood applications of dieldrin-impregnated ground tobacco stems or bentonite pellets at a dosage of 1 pound of dieldrin per acre.

The emulsion formulations were applied by a tractor-mounted weed-spraying rig of a standard type. Flooding of the rice plots began 2 to

3 days after treatment. The postflood treatments were made with a Stearman PT-17 airplane equipped with a dust hopper and flying at a level of from 6 to 10 feet.

The test plots and three check areas were surveyed weekly for mosquito larvae. Two sampling devices were employed: (a) a metal cylinder (1 square foot) equipped with a hardware cloth bottom, and (b) a metal cylinder (0.5 square foot) containing a shallow cone of 60-mesh screen with a hole 1 inch in diameter at the apex and a 1-inch metal strip as the base perimenter. Both devices were placed directly over the sampling site and pressed into the soil. Trapped larvae were removed from the square foot sample with a fine mesh strainer and counted. Specimens captured by the cone cylinder remained in the narrow trough at the base of the cone when the cylinder was removed from the water and thus could be counted easily.

In addition to the weekly surveillance, por-

tions of the plots which had been drained and reflooded 10 weeks after the preflood treatments were inspected at 24- and 48-hour intervals to evaluate the residual action of the treatments against *Psorophora* larvae.

The 1953 experiments included preflood airplane applications of dieldrin emulsion at the rates of one-half and 1 pound of dieldrin per acre to rice fields of 48 and 101 acres, respectively. A PT-17 equipped with venturi-type nozzles was used for the spraying. Two small plots (one-quarter and 1 acre) received preflood applications of dieldrin emulsion at rates of 0.25 and 0.75 pound of dieldrin per acre. Ground equipment was used in making these applications. Dieldrin-impregnated bentonite pellets which were applied by a hand-operated seeder at a rate of 1 pound of dieldrin per acre were used to treat 4 acres. In two postflood applications, pregerminated seeds were broadcast by hand after having been treated with sufficient dieldrin wettable powder to give 1 pound of dieldrin per acre.

In 1953, all sampling was accomplished with the metal cylinders equipped with a hardware cloth bottom. As the primary appraisal was for *P. confinis* larvae, it was necessary to create conditions suitable for the propagation of this species in the test plots. At weekly intervals, selected terraces in each of the test plots were drained and maintained in this state for 7 to 10 days to permit oviposition by *Psorophora* females. The terraces were then inundated, and larval counts secured at 5, 24, and 48 hours after flooding. Similar practices were followed in the untreated fields at intervals of 24, 48, 72, and 96 hours. Weekly samples were taken in undrained treated and untreated terraces in order to measure the prevalence of those mosquitoes which oviposit in water.

To observe the effect of the mosquito control procedures upon rice water weevil infestations, samples of rice plants were examined weekly for larvae and cocoons of the weevil. The sampling technique was similar to that of Isely and Schwardt (3). Two to ten samples of five rice plants per sample were taken in a plot; the number of samples taken depended on the size of the field. The plants were selected at random and removed with the roots and soil attached. Each sample was washed through a

set of interlocking sieves, 10-, 20-, and 40-mesh. The stages of the weevil detected in the washed residue or attached to the roots were noted.

Results of Experiments

The 1952 experiments indicated that preflood applications of DDT at 3 pounds per acre provided 4 to 5 weeks of effective control of *Anopheles* and *Psorophora* larvae after flooding of the fields. Dieldrin applied at the rate of 1 pound per acre as a preflood treatment gave control of *Anopheles* larvae for only 2 to 3 weeks but yielded excellent abatement of *Psorophora* larvae for approximately 10 weeks after application. *Psorophora* larvae averaged less than 1 larva per sample for the entire 10-week period. To obtain a more critical measure of the residual action of dieldrin, 3 terraces which had undergone dewatering and reflooding approximately 10 weeks after treatment were checked for *Psorophora* breeding at 24, 48, and 72 hours after inundation and again at an interval of 120 hours. The results showed a marked reduction of *Psorophora* larvae with the lengthening of the time interval as compared to continued high levels in an untreated check plot (see table).

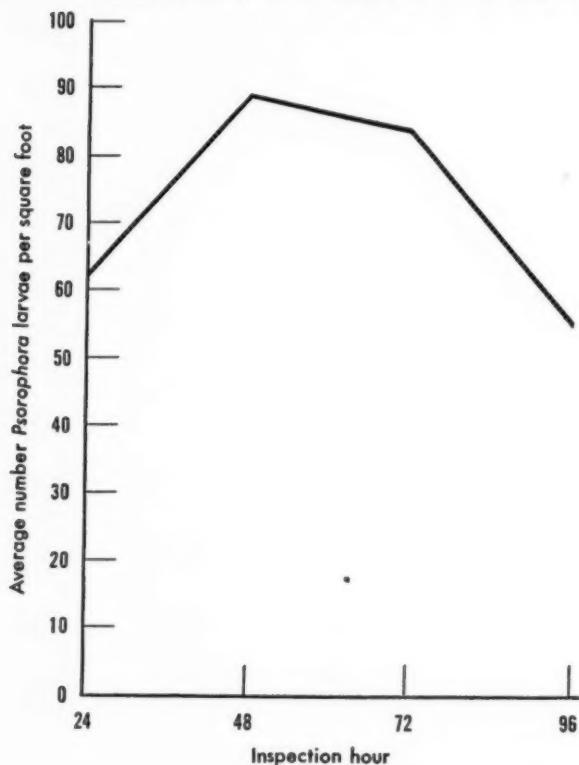
Effect of 10 weeks' old dieldrin emulsion treatment¹ upon breeding of *Psorophora* larvae in rice terraces subject to dewatering, drying, and reflooding cycles

Inspection intervals	Average number of larvae per sample			
	Sub-plot 1	Sub-plot 2	Sub-plot 3	Check plot
24-hour-----	1. 2	8. 6	60. 9	-----
48-hour-----	1. 3	15. 1	5. 8	67. 7
72-hour-----	. 1	. 1	1. 4	69. 2
96-hour-----	-----	-----	-----	111. 2
120-hour-----	. 1	0	. 1	69. 0

¹ Treated with 1 pound of dieldrin per acre.

Postflood applications of dieldrin-impregnated tobacco stems or bentonite pellets failed to give lasting control of *Psorophora* larvae. One plot treated with the dieldrin-impregnated bentonite showed an average of 9 *Psorophora* larvae per sample 4 weeks after treatment.

Figure 2. Average seasonal prevalence of *Psorophora* larvae in untreated rice fields near Cleveland, Miss., 24 to 96 hours after flooding.



Another plot showed an average of 25 *Psorophora* larvae per sample 6 weeks after treatment. Heavy infestations of *Anopheles* occurred within 2 to 3 weeks after flooding of the fields.

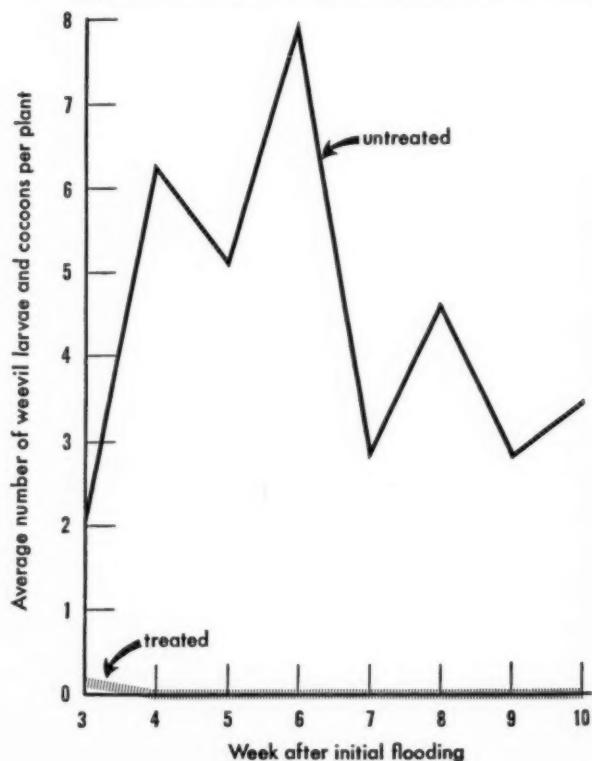
The 1953 tests demonstrated that a preflood application of dieldrin emulsion at a rate of 1 pound of dieldrin per acre would control *Psorophora* breeding in rice fields throughout the rice-growing season. As indicated in figure 1, 5 of the 9 examinations showed 100-percent mortality of *Psorophora* larvae within 48 hours after refloodings. In the untreated plots, the average number of *Psorophora* larvae showed little change during the 24- to 96-hour examinations (fig. 2).

The range of mortality in the other four inspections was from 95 to 99 percent. On the 24-hour examinations, dead larvae, and also live larvae incapable of surfacing, were often found. The indications were that a large part of the mortality occurred during the first 24 hours after flooding. No control of anopheline larvae was obtained.

Similar effective results were secured with dieldrin emulsions applied at a rate of one-half pound of dieldrin per acre as a preflood treatment. Essentially the same levels of mortality were obtained at 48 hours after flooding with both dosages, but at the 24-hour inspections the average mortality of *Psorophora* larvae in the plots receiving 1 pound of dieldrin per acre was 94 percent, as compared with 81 percent for the field treated with one-half pound of dieldrin per acre. In the latter field, the average density of larvae at the 5 hours' observation was well below that found in the field receiving the 1-pound-per-acre dosage. Again, the prevalence of anopheline larvae was unaffected by the dieldrin treatment.

In the small plot tests with dieldrin at 0.25 and 0.75 pound per acre, satisfactory control was apparent with the heavier dosage 8 weeks after the initial flooding of the field. Treatment with 0.25 pound per acre did not prevent

Figure 3. The prevalence of larvae and cocoons of the rice water weevil, *Lissorhoptrus simplex* (Say), in a rice field near Cleveland, Miss., receiving a preflood application of 1 pound of dieldrin per acre as a water application as compared to that of an untreated check field.



Psorophora breeding when the test plot was drained and reflooded on the third week after treatment.

Fields treated with dieldrin-impregnated bentonite pellets or with pregerminated treated seed did not display satisfactory control of *Psorophora* larvae when reflooded 4 weeks after treatment.

Excellent reductions in the rice water weevil populations for periods of 9 to 10 weeks after flooding (fig. 3) were obtained from the application of dieldrin emulsion at dosages of one-half and 1 pound per acre. In the single plot receiving a dosage of 0.25 pound of dieldrin per acre, the level of reduction obtained was considered unsatisfactory. However, both the applications of dieldrin-impregnated bentonite pellets and that of treated pregerminated seeds provided effective reductions of the weevil.

Discussion of Results

Observations and light trap data have indicated that a relatively small number of *Psorophora* eggs overwinter and serve as "seed" for the forthcoming generation. Although few adults are present in early spring, the buildup of *P. confinnis* populations is rapid after June 1, the prevalence of the species reaching its maximum levels in early July. This increase is associated directly with the water management practices followed for the June-July period.

Because of the interrelationship of rice water weevil and *Psorophora* infestations, the control of the former by any means other than water management would be of definite benefit in the abatement of rice field mosquitoes. Under continuous flooding of the fields, the breeding area available for *Psorophora* would be reduced markedly. In addition, any chemical measure which was toxic to both insects would be more acceptable to the rice grower since its adoption would be on an economic as well as on a health basis.

The results achieved with dieldrin emulsion as a preflood treatment at one-half and 1 pound of dieldrin per acre indicate that this chemical is equally effective against both the rice field mosquito and the rice water weevil. The application of one-half pound per acre is obviously

a less expensive treatment, but since it was made 4 weeks later in the season than the 1 pound-per-acre application, its effectiveness was appraised for 7 instead of 11 weeks. Consequently, while treatment with 1 pound of dieldrin per acre can be recommended as being effective for the entire rice growing season, further tests are required with the one-half pound-per-acre dosage.

Based on the current market prices of the insecticides, the cost per acre of airplane treatment at a rate of 1 pound of dieldrin per acre was \$4.56. At a treatment rate of one-half pound per acre, the cost amounted to \$2.73.

Summary

Preflood aerial treatment of rice fields at Cleveland, Miss., with dieldrin emulsion at the rate of 1 pound of dieldrin per acre effectively controlled the breeding of larvae of *Psorophora confinnis* (Lynch-Arribalzaga) for the entire rice-growing season. Similar treatment at one-half pound of dieldrin per acre gave excellent control of rice field mosquito breeding during the 7-week period of appraisal.

Preflood treatments of dieldrin at 0.25 pound per acre as an emulsion and at 1 pound per acre as impregnated bentonite pellets or postflood applications of dieldrin-impregnated ground tobacco stems, bentonite pellets, or dieldrin-treated pregerminated seeds did not give satisfactory lasting control of *Psorophora* larvae.

All dieldrin treatments failed to give lasting control of anopheline larvae.

Dieldrin applications of one-half to 1 pound per acre yielded excellent reductions of the rice water weevil, *Lissorhoptrus simplex* (Say), populations regardless of the time and method of treatment.

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From the SOCIAL SECURITY BULLETIN

Voluntary Health Insurance Coverage Of Aged OASI Beneficiaries

What is the extent of voluntary health insurance coverage among aged beneficiaries of the old-age and survivors insurance system? Answers to this and related questions, obtained in the course of a national survey of the economic resources of aged beneficiaries which the Bureau of Old-Age and Survivors Insurance of the Social Security Administration made in 1951, are analyzed by Dorothy McCamman and Agnes W. Brewster in an article in the August 1954 issue of the Social Security Bulletin.

Three out of every 10 aged beneficiaries had some form of voluntary health insurance. For 1 in 20, the protection was very limited, usually only an accident policy. Only 1 in 40 had anything approaching comprehensive protection against medical bills. Concentration of protection for aged beneficiaries—as for the population at large—was on hospitalization. Of all aged beneficiaries, 23 percent were insured against hospital care costs; more than half of them had no other type of policy.

As the authors point out, the techniques of group enrollment, payroll deductions, and employer participation in premiums—techniques responsible for the relatively broad health insurance coverage of the general population—are not easily applicable to persons who are no longer members of employed groups. Reflecting the greater incidence of protection among working groups, the survey found that beneficiaries whose retirement benefits had been suspended during the survey year because of earnings in covered employment were much more likely

to have health insurance than were those who drew benefits all year.

Continuation of health insurance coverage on an individual basis after retirement, although not usually possible with commercial insurance, has become increasingly possible under Blue Cross and Blue Shield plans for those able to afford the non-group rates. Such characteristics of voluntary health insurance explain the survey findings that, in contrast to the unprotected group, beneficiaries with hospitalization insurance were slightly younger, had started to draw social security benefits more recently, had somewhat larger incomes from reasonably permanent independent sources, and were more likely to be receiving a pension from a former employer or union.

The size of the community in which beneficiaries live was found to have little or no relation to the ownership of hospitalization insurance. The absence of a significant urban-rural difference is explained by the fact that OASI beneficiaries—regardless of where they live after retirement—come originally from predominantly urban settings where the employment covered by the program is concentrated.

The amount of hospitalization insurance coverage among aged beneficiaries is compared with that among the total noninstitutional population aged 65 and over, as determined by a census survey in March 1952. The overall proportion insured against hospital costs was somewhat higher for the total aged group—26 percent—than for OASI beneficiaries—23 percent. Beneficiaries whose benefits had been suspended during the survey year because of employment were about as likely to have protection against costs of hospital care as were all persons aged 65 and over and still in the labor force.

An article to be published in an early issue of the Bulletin will present the findings on hospitalization rates of aged beneficiaries during the 1951 survey year.

Social Security Bulletin is issued monthly by the Division of Research and Statistics, Social Security Administration. \$2 a year (\$2.75 foreign mailing). 20 cents a copy. Superintendent of Documents, Washington 25, D. C.

Progress in Reporting Mental Hospital Statistics

*Fourth Annual Conference of
Mental Hospital Administrators
and Statisticians*

THE FOURTH Annual Conference of Mental Hospital Administrators and Statisticians, sponsored by the National Institute of Mental Health, Public Health Service, was held in Bethesda, Md., on April 19-20, 1954, to discuss developments in the field of mental hospital statistics. The conference was attended by delegates from the 15 States which are members of the Model Reporting Area for Mental Hospital Statistics and by a representative from the Veterans Administration. The States composing the model reporting area are: Arkansas, California, Illinois, Indiana, Kansas, Louisiana, Michigan, Nebraska, New Jersey, New York, Ohio, Pennsylvania, Texas, Virginia, and Wisconsin. Also present were observers from the States of Massachusetts and Oklahoma.

In his opening remarks, Dr. R. H. Felix, director of the National Institute of Mental Health, indicated that the idea of States working in concert for better, more meaningful, and more comparable statistics had caught on in States other than those represented as well as in other areas of the world. A number of requests for information as to purpose and membership requirements of the area had come to him. The report, Training and Research in

State Mental Health Programs, published in 1953 by the Council of State Governments, had, in its recommendations dealing with the responsibilities of the States in the field of mental health, urged that "all States should cooperate with the Public Health Service in the adoption of uniform terminology and statistical reporting procedures in the field of mental health." At the February 1954 National Governors' Conference on Mental Health a 10-point program was recommended for action by all the States. One of these points stated: "One of the important obstacles to adequate evaluations of procedures and therapies is a lack of uniformity in statistical methods in mental hospitals and clinics throughout the country. All States should cooperate with the United States Public Health Service and the American Psychiatric Association in the adoption of uniform terminology for statistical procedures in the field of mental health." That these needs transcend national boundaries is shown by the fact that the World Health Organization had requested and received permission from Dr. Felix to publish excerpts from the proceedings of the previous conferences for the benefit of experts in mental health and committees on vital and health statistics in some 30 countries.

Prepared by the Current Reports Section, Biometrics Branch, National Institute of Mental Health, National Institutes of Health, Public Health Service.

problems in their statistical departments since the third annual conference held in 1953. That progress had been made during the year was evident. Every State represented was already using the Register of Hospitals Recognized and Authorized for the Treatment of Mental Disorder, established by the model reporting area in 1953 to determine the first admission or readmission status of admitted patients. This meant that the decision of the States to make

definitions of first admission and readmission uniform and to make statistics more comparable in the area from State-to-State had been implemented. With one exception, every member State of the area would be using the new, revised psychiatric nomenclature by the end of 1954. The use of a common diagnostic language is essential for comparing the diagnostic distributions of patients admitted to or resident in the mental hospitals of the respective States.

Participants in the Conference

Model Reporting Area

Josephine W. Knowles, registrar, State Hospital, Little Rock, Ark.

R. D. Morgan, statistical research officer, State Department of Mental Hygiene, Sacramento, Calif.

Phillip W. Wenig, supervisor, research and statistics section, Department of Public Welfare, Springfield, Ill.

Irving Miller, statistician, division of mental health, State Department of Health, Indianapolis, Ind.

Jack C. Pulliam, biometrics supervisor, State Department of Social Welfare of Kansas, Topeka, Kans.

Louise Kemp, chief, division of research and statistics, State Hospital Board, Baton Rouge, La.

Robert Glass, procedures analyst, State Department of Mental Health, Lansing, Mich.

John F. Wenstrand, chief, research and statistics, State Department of Assistance and Child Welfare, Lincoln, Nebr.

Emil Frankel, Ph.D., chief, bureau of social research, State Department of Institutions and Agencies, Trenton, N. J.

Benjamin Malzberg, Ph.D., director, bureau of statistics, State Department of Mental Hygiene, Albany, N. Y.

Donald E. Smeltzer, administrative assistant, State Department of Public Welfare, Columbus, Ohio.

Gertrude H. Thompson, statistician, research and statistics, State Department of Welfare, Harrisburg, Pa.

H. H. Ullom, biometrics supervisor, Board for

Texas State Hospitals and Special Schools, Austin, Tex.

Edna M. Lantz, statistician, State Department of Mental Hygiene and Hospitals, Richmond, Va.

John W. Mannering, chief statistician, bureau of research and statistics, State Department of Public Welfare, Madison, Wis.

Other participants

Nelson A. Johnson, director of social service, Warren State Hospital, Warren, Pa.

Morton Robins, chief of the resources and evaluation division, reports and statistics service, Veterans Administration, Washington, D. C.

Unofficial observers

Thomas F. Pugh, Ph.D., director, division of research and statistics, State Department of Mental Health, Boston, Mass.

Donald D. Tolliver, Department of Mental Health, Oklahoma City, Okla.

Dorothy Shelley, administrative assistant, bureau of mental health, State Department of Welfare, Harrisburg, Pa.

National Institute of Mental Health

R. H. Felix, M.D., director.

Morton Kramer, Sc.D., chief, biometrics branch.

Hyman Goldstein, Ph.D., chief, current reports section, biometrics branch.

Anita K. Bahn, chief, outpatient reports and records unit, biometrics branch.

Bernard H. Kroll, statistician, current reports section, biometrics branch.

Thirteen of the fifteen States either are conducting cohort studies or are planning to conduct them in the near future. These are studies in which groups of patients with common characteristics, such as first admissions of a specified year with given age, sex, diagnosis, and so forth, are followed from the date of admission (starting point) through their hospital experience to determine their disposition by trial visit, discharge, or death (end point) within specified periods of time following admission. There are various types of cohort studies, each one of which is designed to answer specific questions.

In a number of States, the expansion of the functions of the statistical department to include accounting and other business management duties has taken place. In most cases, this would bring about the acquisition of additional tabulating machines and personnel and, in the long run, would make more men and machines available for statistical studies. Cautions were voiced at the conference that such rearrangement of functions should not result in converting a statistical department into an accounting department.

Among the projects currently under way or proposed for the near future in the 15 States are:

Modification of the statistical system to present a more accurate followup of the patients from the time of their first admission to any later admissions or to the time of transfer from one hospital to another.

Survey of inpatient populations in terms of which patients might possibly be cared for outside a mental hospital.

Cohort studies of first admissions by therapy, age, sex, and diagnosis.

Followup studies of patients on extramural care to determine what happens to such patients; that is, how many patients adjust and are retained in the community; how many die; how many relapse and are returned to the hospital.

Study of criminal behavior of mental patients before and after hospitalization.

Study of treatment indicated for patient, treatment given patient, and treatment results.

Study of the disposition of schizophrenic pa-

tients receiving somatic treatment compared to the disposition of those not receiving such treatment.

Followup study of lobotomized patients.

Comparison of adjustment in lobotomized experimental groups and in matched nonlobotomized control groups.

Retrospective study of patients discharged from mental hospitals 10 years ago in order to establish their status as of the present.

It was emphasized that the interpretation of some of the studies currently under way in mental hospitals depends on a knowledge of the community distribution of mental disorder, on a greater understanding of the types of patients getting into such hospitals, and on a determination of what happens to patients once they are back into the community. An epidemiological orientation toward mental disease is urgently needed.

Well-controlled, evaluative studies of therapy using patients selected at random and matched for therapy and nontherapy groups are sadly lacking in the field of hospitalized mental illness. Until such studies are conducted, the relative values of specific therapeutic measures will be doubtful.

Need was indicated by the States represented at the conference for certain statistical data on residents of these States who are receiving inpatient care for mental illness under the auspices of the Veterans Administration. Such data are necessary in order to arrive at definitive knowledge with respect to the problem of hospitalized mental illness among such residents. As a result, the conference requested the Veterans Administration to supply statistical data in the form of tables or necessary punchcards. Under this plan, tabular data would be obtained and would be distributed by the National Institute of Mental Health to the States concerned.

Uniform Tabulations

The Biometrics Branch of the institute presented a review dealing with special census tabulations prepared by the area States to date (1952-53). The problems attending such preparation were reviewed. Such problems related

to difficulties encountered in changing from the old to the new psychiatric nomenclature, in getting complete diagnoses from the hospitals on all, or almost all, patients, in changing record forms and information to be reported, in completing schedules on time with personnel shortages, and so forth. Reviewed and reemphasized was the part that completed tabulations of the type and format requested by the National Institute of Mental Health play in permitting the calculation of meaningful resident patient rates, first admission rates, discharge rates, and death rates, by age, sex, length of stay, and diagnosis. Unanimously agreeing that the basic tabulations requested are useful and essential to an understanding of mental hospital operations, the conference group voted that the same tabulations be completed for the year 1953-54.

Furthermore, it was resolved that decisions with respect to statistical reporting, approved by the model reporting area States as represented by their conference delegates, be binding on all such States as a prerequisite to membership in the model area. This would indicate that the urge to secure uniformity for interstate comparison was a dominating influence on the thinking of the conference.

There was general agreement that the reporting picture for the year 1953-54 would show marked improvement in view of the strengthening of the statistical reporting systems that has taken place during fiscal year 1952-53 in the various States and in view of greater understanding and acceptance of the revised psychiatric nomenclature by the medical staffs.

Cohort Studies

The literature dealing with cohort studies of mental patients was generally reviewed. The purpose and methodology of such studies were discussed, covering such topics as definitions of the groups studied and the end points used, the computation of rates and methods of analysis, and the graphic presentation of results. In connection with this discussion, there was presented a series of slides showing results of a cohort study of first admissions to the Warren State Hospital, Warren, Pa., during the period 1916-50. This study is being carried out by the

Biometrics Branch of the National Institute of Mental Health in cooperation with the hospital.

The purpose of the study is to determine the proportions of first-admission patients with specified characteristics (age, sex, and diagnosis) admitted in certain years, who were continuously resident in the hospital, released alive, or dead within specified periods of time following admission to the Warren hospital and to ascertain the probabilities of remaining continuously in hospital, of release, or of death during a specified interval of time after admission. First admissions to the Warren State Hospital were followed from the date of admission until the date at which the patient was first released alive to the community (either on a trial visit or direct discharge basis) or died in the hospital. Patients who returned to the hospital after a trial visit or discharge were not reentered into the experience. This rule was adopted because the study was designed to answer this question:

Given a group of first admissions with specific characteristics, what are their chances of being returned to the community for the first time within specified periods after admission? Some studies have taken the date of discharge from the books as the end point. This approach not only increases the interval between admission and end point but also masks what happens to patients in the period of convalescent care. The number of returns from convalescent care through failure in the community are not available in this type of study. It was deemed more reasonable to set up additional studies to answer such questions as:

At what rate are released patients with specified characteristics readmitted to the hospital?

Of those released patients who stay in the community, what proportion successfully adjust?

What environmental and social factors encountered by discharged patients are related to relapse or successful readjustment in the community?

How are relapse rates among released patients related to diagnosis, sex, age on admission, length of hospitalization, and therapy?

Discussion following the showing of the slides

emphasized that although the Warren State Hospital study provides more precise data about length of stay and probabilities of release alive or of death in relation to age at time of admission, sex, and diagnosis, and changes in these probabilities over a period of time, extreme caution should be exercised in attempting to explain what has produced these changes. For example, there has been a considerable improvement in the rate of release of functional psychotics during the first year of hospitalization. In the period 1916-25, 42 percent of such first admissions were released within 1 year following date of admission as compared with 62 percent in the period 1946-50. One may ask: Is the improvement in the release rates due only to the use of new therapy, which is for the most part unevaluated to date? Is it due to some other fact or factors, or a combination of therapy and other factors? The evaluation of therapy from mass hospital data is difficult because control groups are rarely incorporated into the study design and because patients are never randomly placed into various treatment groups and kept on well-controlled predetermined therapeutic plans. Other factors that influence the release rate are:

Type of patient admitted. Is the patient being admitted today a better risk than the one admitted 30 years ago?

Administrative factors. Are the administrative factors that enter into decisions affecting release of patients the same now as those which were in operation 30 years ago?

Condition of patient at time of release. Are patients as comparably well now at time of release as in earlier periods, or are patients released sooner as a result of a different attitude on the part of the hospital staff toward the expected condition of a patient at time of release?

Community factors. What factors in the community's attitude toward the mentally ill have brought about greater chances of release?

Much more research is needed to provide answers to the foregoing questions. Despite the limited answers that cohort studies yield, such studies do provide mental hospital administrators with a method for describing accurately the flow of patients through the hospitals, pointing up significant trends in the rates at which

patients are released from or die in the hospital and pinpointing significant areas for research.

Discharge and Death Rates

Discussion of discharge and death rates indicated there is great variation in the types of rates used in the various States. For instance, discharge rates might pertain to discharges per 100 admissions, per 100 first admissions, per 100 patients on the books, per 100 average daily resident population, and so forth. Similar variations are found in death rates. Although computed in different ways and with different bases, the discharge and death rates used by the States are primarily intended to furnish some indication of hospital turnover. The lack of uniformity both in the definition of "discharge" as well as in the base used in the denominator of the rate makes for incomparabilities in published rates. There was general agreement that the rates left much to be desired since they are subject to considerable misinterpretation.

A committee was appointed to provide the States with guidance for developing and using cohort methodology and to look into the possibility of standardizing various movement rates. The committee is to consider the possibility of preparing a manual which describes the purposes of cohort studies and sets up procedures and methods for conducting such studies. The committee will also evaluate hospital discharge and death rates in use and make recommendations for possible revisions of current practices.

The conference touched upon the subject of followup studies of patients released or discharged from mental hospitals. Such studies, involving field followup of patients in the community, are designed to determine what happens to patients following discharge from the hospital. What has mental hospitalization done for them? Even though it may be demonstrated that patients are being released more rapidly than ever before, are the patients really better off? Do they relapse at a faster rate as compared with former years? At the present time, only one State—California—is planning to institute a study in this area. In another State, Pennsylvania, a State hospital is planning to conduct a similar study.

Statistics for Consumers

The frequency of requests from administrators, legislative bodies, and lay groups for statistical material and the uses to which such material has been put were discussed. The type of statistics prepared and the manner of presentation were deemed important in stimulating interest in research and in care and treatment programs in this field, and also in avoiding the misinterpretation and misuse of data in view of the varying levels of sophistication among the consumers of such data. In a number of States, the hospital administrators have been interested in having cohort studies conducted in their hospitals so that they would see for the first time just what is happening in the movement of patients in and out of their institutions.

Results of such studies would stimulate medical staffs to make additional inquiries and examine their treatment programs more objectively. The value that rates derived from cohort studies may have in conversations with patients and their relatives was stressed, particularly in indicating the probability of release.

A committee was set up to determine ways and means of presenting statistical mental hospital data to the public in an easily understood manner. This committee is also to make recommendations as to the kinds of data that would be useful for presentation. A number of delegates felt that this project is of great importance if the accomplishments of mental hygiene departments over the years are to receive the careful attention of legislative bodies and the public.

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A Study of Industrial Noise And Hearing Loss In a Controlled Population

—A Preliminary Report—

By C. D. YAFFE, M.S.

THE RELATIONSHIP of industrial noise to hearing loss is something which is probably of as great interest and concern as any problem currently faced in the field of occupational health. The numerous symposiums held, the training courses presented, and the committees established during the past few years to deal with the subject are evidence of the problem that exists. Exploration through these media of the available information shows that for various age levels there is a very considerable amount of knowledge about hearing, both normal and otherwise. There is also general acceptance of the belief that excessive noise of sufficient intensity and type (frequency) will produce permanent adverse effects upon hearing in individuals susceptible to noise provided there is exposure over a sufficient length of time. Lacking, however, is sufficient information regarding the relationship of type and intensity of the noise to time of exposure and hearing loss upon which to base standards, particularly where compensa-

Mr. Yaffe has, since 1948, been chief of the Engineering Section at the Public Health Service's Occupational Health Field Headquarters in Cincinnati. During the preceding 5 years, he was chief industrial hygienist for the State of Washington. This paper was presented, April 29, 1954, to the engineering session at the annual meeting of the American Industrial Hygiene Association in Chicago.

tion is under consideration. The dearth of suitable data of this sort is emphasized in the report recently released by the American Standards Association's Z24-X-2 exploratory subcommittee entitled "The Relations of Hearing Loss to Noise Exposure." This report was based on a thorough survey of all significant information available.

Realizing the immediate necessity for as much usable information as can be obtained, many individuals, organizations, and agencies have begun the collection and interpretation of audiometric data and analyses of industrial noise. Through their combined efforts some of the urgently needed answers should begin to appear within the next few years.

This paper describes one of the new studies which, it is hoped, will produce data helpful in the study of the relationship of noise to hearing loss.

Prison Industrial Operations

During the summer and fall of 1952, a survey, preliminary to a long-term study, was made of industrial operations conducted at several Federal penitentiaries. This preliminary investigation revealed the presence of a fairly large number of operations producing overall sound levels in the general range of 75 to 105 decibels, where some authorities feel reasonable standards might eventually be established. A wide variety of frequency characteristics was also presented by the industrial noises encountered.

Of equal importance, it was found that a fairly substantial number of workers are exposed to these noise conditions for periods of at least a year. Furthermore, a considerable number of the men have had little or no previous industrial experience involving exposure to noise. In addition, the study situation is unique in that it is known that none of the men has any significant exposure to noise except while on the job.

As a result of these findings, agreement was reached and a plan developed for a cooperative study by the United States Bureau of Prisons,

the Federal Prison Industries, Inc., and the Occupational Health Program, Division of Special Health Services of the Public Health Service. The Bureau of Prisons is responsible for the operation of the Federal penal institutions. Many people are not aware, however, that the industrial operations in the prison system are conducted by a Government-owned corporation established by the United States Congress in 1934. This corporation, called the Federal Prison Industries, Inc., produces a number of manufactured products. The law requires that there be sufficient diversity that free industry will not be adversely affected; and further, that there shall be no open market competition and that all products shall be sold to Government departments and agencies. In addition to the materials produced, the program of the Federal Prison Industries trains inmates to do useful work and to earn some money for the care of dependents and for reestablishing themselves upon completion of their sentences.

Under the plan of study developed, audiometric data and information on noise conditions are being collected at four penitentiaries—those located at Lewisburg, Pa.; Atlanta, Ga.; Leavenworth, Kans.; and Terre Haute, Ind. The industrial operations under study include those involved in the manufacture of steel shelving, wooden and steel furniture, brushes, shoes, clothing, cotton and woolen textiles, and printing. The equipment used and manufacturing methods employed are the same as those in private industry, and the men work the usual 40-hour week. Sound levels encountered are similar to those for comparable operations reported in the literature by other investigators.

A group of approximately 600 workers in these industries was selected for special study. Each man will have his hearing tested at 3-month intervals for a year. The frequency of audiometric tests after the first year will depend upon the findings. It should be possible to follow the hearing of the majority of this study group for several years. Nevertheless, some of them will be lost to the study through transfer, parole, or other causes, despite the fact that the group was picked from men expected to remain in custody more than 2 years. Men in the study group who leave the industry are replaced, however, by new workers having

similar job assignments. Through such turnover, it is likely that some useful audiometric data correlated with noise exposures will eventually be obtained on about 1,500 to 2,000 workers.

Since audiometric tests were not performed prior to the study, baseline information on the original 600 men is lacking. This presents the same problem encountered anywhere when a program of hearing tests is first started on a group already employed. The data on the initial group, therefore, are not ideal. They are quite useful, however, if a large enough number of individuals are studied and compared with control groups not subjected to significant sound levels. Meanwhile, as a result of turnover in employment, there is a steady increase in the number of men in the study group on whom baseline data are available. Consequently, the quality as well as the volume of data should improve as the study progresses.

In addition to the study group from the Federal Prison Industries, there is a control group of approximately 150 inmates whose jobs do not include exposure to appreciable noise. These include men employed in prison hospitals, libraries, and comparable locations. This group will have hearing tests semiannually.

Under Medical Supervision

Medical care in Federal penitentiaries is provided by physicians from the Public Health Service who are assigned to these institutions. The program of audiometric testing in each prison is under the direct supervision of its chief medical officer. One byproduct of this study is that all new inmates at 2 of the penitentiaries now receive audiometric testing as a regular part of the physical examination given at the time of admission. The program may be extended to the other 2 Federal penitentiaries if it does not produce too much of an added burden on their medical departments.

All personnel performing audiometric tests have received personal instruction in techniques and procedures from a special consultant employed for this study by the Public Health Service. This consultant is a member of the subcommittee on noise in industry of the committee on conservation of hearing of the

American Academy of Ophthalmology and Otolaryngology, and, consequently, he is in a position to apprise that committee of developments in this study.

The rooms used for audiometry are located in the hospitals of the penitentiaries. While fairly quiet rooms for testing were found, they were improved for the desired purpose by acoustical treatment. Background noise levels in these rooms do not exceed 40 decibels.

The superintendents of industries in each of the penitentiaries have made valuable contributions to the study. It is through the Federal Prison Industries that the work and biographic data on all workers are obtained; and it is from these data that the study group is selected. While exact mechanisms of operation vary from one institution to another, the Prison Industries participates to a very considerable extent in the scheduling of men for testing and in arranging for them to leave their jobs for such purposes. This is not a simple matter since, in addition to the interruptions to production schedules, as encountered in private industry, special security problems are involved.

Measurements of noise are made by engineering personnel from the Division of Special Health Services of the Public Health Service. Included are not only determinations of overall sound levels but also octave band analyses. Several days are spent annually at each institution obtaining these data.

Provisions for Data Analysis

All data from the study are kept at the Occupational Health Field Headquarters in Cincinnati. Each penitentiary hospital at regular intervals sends all audiometric data to Cincinnati where they are transferred to punch-cards specially designed for the study. The data sent include not only audiograms on the men in the study and control groups but also on all new inmates who are tested. This provides material for comparing the hearing of the prison inmates with the hearing of the general population as well as for other studies.

A separate card is maintained for each man tested. On it is recorded detailed information about him, his job, and the precise location where he works. It also contains space to record 12 sets of audiometric data on the individual and the dates of the tests.

Information obtained from sound analyses in the factories is likewise placed on specially designed punchcards. Detailed information about the type of sound at each location is recorded as well as the maximum, minimum, and average sound levels at each octave band and for the overall level. The latter data are also shown graphically on the reverse side of the card.

Through a special code used on both types of the cards to identify factories, departments, and work locations, cards on all men exposed to a certain type of noise condition may be easily separated for study.

The plan for hearing tests has been introduced to just one institution at a time and only extended to another when the operating routine had been given a thorough workout and found satisfactory. Consequently, the program at the fourth institution was just started in April 1954, although the first program began in February 1953. Thus, at the moment there are only 1 or 2 audiograms on most of the study group; and it would be inappropriate to attempt to draw any conclusions or even to indicate any possible trends. With the plan now operating on a full scale, however, a much greater volume of data should be accumulated during the coming year. The information obtained also will be more meaningful as it then may be possible to determine whether any changes having statistical validity are beginning to show up.

It is quite likely that no hearing losses attributable to workroom noise will be found in a large proportion of the group being studied. Many men were intentionally included who work in operations where sound levels are considerably below those considered harmful by the majority of authorities. Confirmation of such opinions is of value, however, for negative data are as necessary as positive data in the establishment of standards.

Hospital Insurance Against Poliomyelitis In Des Moines, Iowa, 1952

By ABRAHAM GELPERIN, M.D., Dr.P.H.

THE SEVERE poliomyelitis epidemic in Des Moines, Iowa, during 1952 occasioned an evaluation of one aspect of the medical care costs of this disease—the status of hospitalization protection by various types of health insurance. The city had experienced four minor outbreaks of the disease between 1946 and the summer of 1952. The greatest number of recorded cases during these years was 90 in 1949.

The 1952 Des Moines experience of 316 poliomyelitis cases in a total population of 184,970, a rate of 170.8 per 100,000, permitted an investigation of the extent of coverage by the unique poliomyelitis insurance available since 1949, as well as that of Blue Cross and health and accident policies. Population for 1952 was estimated by projecting changes of each age group and race within each census tract from 1940 to 1950 into 1952.

The study was limited to payment of bills for hospitalization of poliomyelitis patients, exclusive of medical fees. The cost of special duty nursing, and outpatient department and rehabilitation services, if a part of the patient's hospital bill, was included. The study started June 23, 1952, and the cutoff date was April 1, 1953.

The initial cases of the epidemic occurred the week of June 23, 1952, the outbreak reaching a

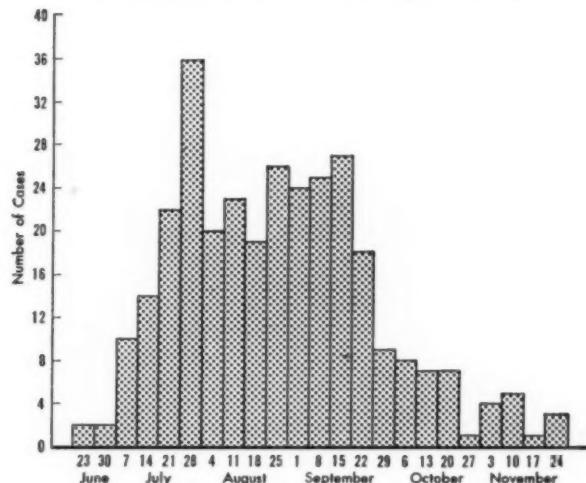
plateaulike maximum the week of July 21, and starting its decline the last of September. The onset of reported cases is shown in figure 1. The spread of the disease throughout the city lacked any pattern.

No cases of poliomyelitis occurred in the age group 60 and over; 4 cases were reported under 1 year of age. The youngest child was 6 weeks old. The Negro population of 8,786 had 3 cases of poliomyelitis in the age group 5-9 and was excluded from the study. Since the oldest patient was 54 years old, the white population through 59 years of age was utilized as the population potentially at risk. There were 313 cases in 151,972 white persons. This population includes the relative handful of persons who had had poliomyelitis, as well as the undetermined and larger group which had experienced subclinical disease.

The population was divided into 3 socioeconomic groups by utilization of the 1950 census data and by local health department information as well (1, 2). In group I, the population had annual incomes greater than \$5,000; professionals, merchants, and executives predominated. Their homes were valued at an average of over \$9,000. Group II was composed mainly of white-collar workers, skilled manual laborers, and storekeepers. Their incomes were between \$2,000 and \$5,000. Included in group III were unskilled and transient laborers, pensioners, and the bulk of the nonwhite population. Income in this group was less than \$2,000 annually, and the average value of their homes was less

Dr. Gelperin is director of the Des Moines and the Polk County Health Departments.

Trend of poliomyelitis epidemic by week of onset of illness, Des Moines, Iowa, 1952.



than \$5,000. Factors such as lack of adequate plumbing facilities and the ratio of persons per room were also utilized in assigning socioeconomic group.

Hospital cases were assumed to be in the income bracket typical of the census tract in which they lived. This assumption may allow a certain amount of error to enter the study.

Twenty-seven percent of the population was in group I, 57 percent in group II, and 16 percent in group III. The attack rate by group is shown in table 1.

The highest attack rate was in group I, an observation supported generally by earlier studies (3-5). There was a tendency only toward a higher incidence in males under age 10 and females aged 15 and older. The highest attack rate was in age group 5-9 for both sexes. However, 33.3 percent of the cases in group I, 26.7 percent in group II, and 17.4 percent in group III were adults (5, 6).

A summation of the total hospital service costs for 288 hospitalized patients computed to April 1, 1953, is presented in table 2. Twenty-five of the 313 patients were cared for in their own homes. The data show the total of patient hospital bills paid by each method of payment within each socioeconomic level. In all economic levels multiple sources of payment were observed. Poliomyelitis insurance was the category least involved with other forms of financial settlement.

All information concerning costs was

obtained from the bills tendered each patient by the hospital. These contained the sources and amounts of payments. Since we have no information as to the insurance holdings of each patient, the data on individuals and families utilizing any of the methods of payment are therefore minimal.

The minimal extent of poliomyelitis, health and accident, and Blue Cross insurance in the families within each socioeconomic level is shown in table 2. The figures for poliomyelitis insurance are considered the most accurate since this type of insurance gave the broadest coverage and used supplemental payment by other forms of insurance least. There was considerable overlapping between all the other sources of payment.

The financial assistance of the National Foundation for Infantile Paralysis was primarily to those families without insurance, but also supplemented health and accident and Blue Cross insurance to cover the cost of such items as special duty nursing and appliances.

The total presented for the foundation does not account for the considerable amounts spent by the foundation for such items as special equipment, supplies, medical social workers, physical therapists, and general duty nurses. These costs do not appear on the patient's hospital bill. Nor was the monetary value of the assistance of some 250 volunteer lay hospital aides trained by the foundation charged to the patients.

The important aspect, however, is the extent of health insurance coverage within the three socioeconomic groups. Only 11 families in group I (11.2 percent), 18 families in group II (13.1 percent), and 10 families in group III (25 percent) did not have some form of health insurance against poliomyelitis. Although the number of families within each socioeconomic group is small, it is considered that they may be a reasonably representative sample of families with children in respect to personal financial responsibility for illness due to poliomyelitis. Three families in group I, 9 families in group II, and 5 families in group III did not have any children in the household. Since no data were available on the ratio of childless families within the census tracts or city as a whole, and, as the sample of such families within this study

is quite small, no firm conclusions can be drawn. However, the extent of health insurance coverage found among Des Moines poliomyelitis patients during 1952 suggests a high degree of such health insurance protection against this disease in the community.

Table 3 shows the results of a survey of the

actual physical status of patients within each socioeconomic group, as of April 1, 1953. A detailed study of the pediatric aspects has been presented elsewhere (7). The mild residual category is limited to those cases with a progressively decreasing muscle weakness, without paralysis. Those in the moderate residual

Table 1. Poliomyelitis cases and attack rates among the white population, according to socio-economic group, by sex and age group, Des Moines, Iowa

Age group (year)	Male			Female			Total		
	Popula- tion	Cases	Rate per 1,000	Popula- tion	Cases	Rate per 1,000	Popula- tion	Cases	Rate per 1,000
Group I									
0-4	2,507	15	5.98	2,257	8	3.54	4,764	23	4.83
5-9	1,891	12	6.35	1,886	14	7.42	3,777	26	6.88
10-14	1,485	10	6.73	1,432	9	6.28	2,917	19	6.51
15-19	1,102	4	3.63	1,338	6	4.48	2,440	10	4.10
20-29	2,809	6	2.14	3,391	15	4.42	6,200	21	3.39
30-59	9,783	8	.82	11,082	10	.90	20,865	18	.86
Total	19,577	55	2.81	21,386	62	2.90	40,963	117	2.86
Group II									
0-4	5,091	21	4.12	4,932	16	3.24	10,023	37	3.69
5-9	3,872	21	5.42	3,824	18	4.71	7,696	39	5.07
10-14	3,518	9	2.56	3,347	7	2.09	6,865	16	2.33
15-19	3,119	8	2.56	3,652	10	2.74	6,771	18	2.66
20-29	8,465	9	1.06	9,390	11	1.17	17,885	20	1.12
30-59	17,626	6	.34	20,154	14	.69	37,780	20	.53
Total	41,691	74	1.78	45,299	76	1.70	86,990	150	1.72
Group III									
0-4	1,182	8	6.77	1,146	4	3.49	2,328	12	5.15
5-9	822	8	9.73	817	2	2.45	1,639	10	6.10
10-14	793	2	2.52	737	4	5.43	1,530	6	3.92
15-19	761	3	3.94	1,162	7	6.02	1,923	10	5.20
20-29	2,666	2	.75	3,101	2	.65	5,767	4	.69
30-59	5,222	1	.19	5,610	3	.53	10,832	4	.37
Total	11,446	24	2.10	12,573	22	1.75	24,019	46	1.92
City									
0-4	8,780	44	5.01	8,335	28	3.36	17,115	72	4.21
5-9	6,585	41	6.23	6,527	34	5.21	13,112	75	5.72
10-14	5,796	21	3.62	5,516	20	3.63	11,312	41	3.62
15-19	4,982	15	3.01	6,152	23	3.74	11,134	38	3.41
20-29	13,940	17	1.22	15,882	28	1.76	29,882	45	1.51
30-59	32,631	15	.46	36,846	27	.73	69,477	42	.60
Total	72,714	153	2.10	79,258	160	2.02	151,972	313	2.06

Table 2. Payment sources of poliomyelitis patients' ¹ hospital bills by socioeconomic group, Des Moines, Iowa, 1952

Payment source (all or part)	Number of patients ¹	Number of families	Total amount paid	Percent of total	Average cost per patient
Group I					
Poliomyelitis insurance	53	50	\$32,404.05	61.9	\$611.40
Health and accident	12	12	3,460.62	6.6	288.39
Blue Cross	34	33	10,309.14	19.7	303.21
Poliomyelitis foundation	15	13	4,210.21	8.0	280.68
Family	24	24	2,011.31	3.8	83.80
Total			52,395.34	100.0	(²)
Group II					
Poliomyelitis insurance	55	52	\$26,917.51	33.5	\$489.41
Health and accident	34	34	9,848.53	12.3	289.66
Blue Cross	44	44	13,662.08	17.0	310.50
Poliomyelitis foundation	50	50	26,955.93	33.5	539.12
Family	17	17	2,988.01	3.7	175.77
Total			80,372.06	100.0	(³)
Group III					
Poliomyelitis insurance	8	8	\$1,935.63	13.5	\$241.95
Health and accident	8	8	2,138.50	14.9	267.31
Blue Cross	21	19	5,638.96	39.3	268.52
Poliomyelitis foundation	16	16	3,723.62	25.9	232.73
Family	8	8	918.06	6.4	114.76
Total			14,354.77	100.0	(⁴)
Grand total					
Poliomyelitis insurance	116	110	\$61,257.20	41.6	\$528.08
Health and accident	54	54	15,447.65	10.6	286.07
Blue Cross	99	96	29,610.18	20.1	299.09
Poliomyelitis foundation	81	79	34,889.76	23.7	430.74
Family	49	49	5,917.38	4.0	120.76
Total			147,122.17	100.0	(⁵)

¹ Some patients used more than 1 type of insurance.

² Average payment of 105 hospitalized patients, \$499.

³ Average payment of 140 hospitalized patients, \$574.09.

⁴ Average payment of 43 hospitalized patients, \$333.83.

⁵ Average payment of 288 hospitalized patients, \$493.69.

group were characterized by paralysis of one limb or the equivalent. In the moderately severe residual group were those with paralysis of two limbs or the equivalent, and the severe residual category contained patients with more extensive paralytic complications than the moderately severe group.

The classification of patients cannot be absolute. The classification of each patient was

made with no knowledge of his socioeconomic status. The data in table 3 suggest that there was a less severe grade of poliomyelitis in the lowest economic group (5). This small difference cannot be related, however, to the observed incidence levels (table 1). If the home care group, which fell into the no residual or mild residual group, were added to the hospitalized cases, there would be a less than 2-

Table 3. Physical status of 288 white hospitalized patients as of April 1, 1953, by socioeconomic group, Des Moines, Iowa

Physical status	Group I		Group II		Group III	
	Number of patients	Percent	Number of patients	Percent	Number of patients	Percent
No residual	50	47.6	69	49.3	29	67.4
Mild residual	29	27.6	37	26.4	8	18.6
Moderate residual	10	9.5	15	10.7	2	4.7
Moderately severe residual	9	8.6	8	5.7	2	4.7
Severe residual	4	3.8	5	3.6	1	2.3
Deaths	3	2.9	6	4.3	1	2.3
Total	105	100.0	140	100.0	43	100.0

percent change in the combined no residual and mildly affected categories, as well as the combined moderately severe and severely affected categories in all 3 socioeconomic groups.

Summary

A high degree of privately purchased financial protection against poliomyelitis hospital costs was shown by a study of hospital billing to poliomyelitis patients in the Des Moines, Iowa, white population during the severe 1952 epidemic. These costs do not, however, include the considerable sums spent by voluntary and official health agencies or the assistance of volunteer lay groups and individuals. Health insurance extended throughout the 3 socioeconomic levels and covered 88.8 percent in group I, 86.9 percent in group II, and 75 percent in group III. The 288 hospitalized cases involved 275 families, of which 110 (40 percent) utilized poliomyelitis insurance, 54 (20 percent) utilized health and accident insurance, and 98 (36 percent) utilized Blue Cross coverage to pay all or part of their hospital bills. The type of insurance varied between the 3 socioeconomic levels. The highest policy holdings and utilization of poliomyelitis insurance

data are presented and briefly discussed. Cross was in group III. Pertinent morbidity data are presented and briefly discussed.

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Problems of Organized Home Care For the Long-Term Patient

By ARNOLD B. KURLANDER, M.D., M.P.H.

WHEN WE CONSIDER the pressing problems facing public health today, we are immediately confronted with the magnitude of chronic disease and the ever-mounting costs associated with it. The chronically ill or disabled patient has been with us for some time. His numbers increase as the proportion of older persons in our population increases.

One important aspect of this growing problem is the vast and complicated task of providing services to the chronically ill. In this task, health departments today have new opportunities and responsibilities associated with the care of certain long-term patients.

What Is a Long-Term Patient?

According to the National Conference on Care of the Long-Term Patient, the definition "includes only those persons suffering from chronic disease or impairments who require a prolonged period of care, that is, are likely to need or who have received care for a continuous period of at least 30 days in a general hospital

or care for a continuous period of more than 3 months in another institution or at home, such care to include medical supervision, and/or assistance in achieving a higher level of self-care and independence" (1a).

How Many of These People Are There?

The data collected for persons disabled for more than 3 months show that in the United States in 1950 the number was 5.3 million—3.5 percent of the total population.

Who Are These People?

2.1 million are persons 65 years of age and older—17 percent of this age group.

1.8 million are persons from 45 to 64 years of age—6 percent of the age group.

1.4 million are persons under 45—1 percent of the age group.

For the civilian noninstitutional population, illness of more than 3 months prior to disability is considerably more common in the male population. From age 55 to age 64, the ratio of male to female is of the order of 2 to 1.

Where Are These People?

4.2 million—79 percent—are at home or in general hospitals; 14 percent are in long-term hospitals, nursing homes, or homes for the aged; 7 percent are in homes or schools for the mentally deficient.

Dr. Kurlander is acting chief of the Chronic Disease Program, Division of Special Health Services, Public Health Service. This article is based on a speech presented at the meeting of the Western Branch of the American Public Health Association, Seattle, Wash., May 12, 1954.

What Illness and Disability Have They?

The 12 leading causes of chronic disease or disability (1b) are:

1. Cardiovascular-renal disease.
2. Nervous or mental diseases.
3. Rheumatism and allied diseases.
4. Permanent results of accidents.
5. Senility.
6. Tuberculosis.
7. Blindness and diseases of the eye.
8. Chronic diseases of the digestive system.
9. Diabetes mellitus.
10. Chronic results of communicable diseases.
11. Asthma.
12. Cancer.

What Are the Needs of These People?

The chronically ill or disabled need comprehensive medical care which is concerned with diagnosis, treatment, and prevention of illness and disability, as well as the attainment of maximum rehabilitation of the individual within his physical and emotional limits.

How May These Services Be Provided?

Services to the long-term patient can be provided in a host of ways—among them through general hospitals, chronic disease hospitals, nursing homes, outpatient clinics, and the home.

Organized home care is “that phase of comprehensive medical care which through coordinated efforts is designed to meet the individual medical and related social, economic, and vocational needs of those patients who may be treated at home” (2).

Differentiating organized home care programs now in effect in a few communities from the more familiar and customary ways of providing care at home are:

1. In an organized program, administrative responsibility for total care is centered in one agency or institution.
2. There is a plan for the coordination of services and community resources through regularly scheduled formal conferences of all personnel concerned with patient care.

It should be reemphasized that home care services must be coordinated into a total program that will, ideally, include hospitalization, institutionalization, and continued care on an ambulatory basis.

Why Home Care?

Certain basic factors underlie the desirability of a home care program. One of the major considerations in such a program is the shortage of institutional beds. While the time may come when such a shortage is not a problem, it is not now foreseeable. Although many patients require some kind of service, it is not necessarily the 24-hour service offered by an institution. Many services can be given in the home as well as, or better than, in the hospital, and they will frequently be of equal or better quality. When such services are given in the home, they permit a proper utilization of institutional beds.

Moreover, home care permits the use of such family resources as housekeeping, housing, utilities, and food.

Final considerations weighing heavily in favor of organized home care are the great psychological and emotional advantages apparent in allowing certain patients to remain with their families.

Are There Limitations on Such a Program?

Certain limitations will necessarily be imposed by deficiencies in home environment, the extent and complexity of medical needs, individual problems of adjustment and stress, and available resources within the community (3).

Is Home Care a New Idea?

The first committee of the Boston Dispensary, which was established in 1796, stated, in its initial report:

“It having been found by experience, both in Europe and in several of the capital towns of America, that dispensaries for the medical relief of the poor are the most useful among benevolent institutions, a number of gentlemen propose to establish a public dispensary in the town of Boston, for the relief of the sick poor;

which they presume will embrace the following advantages:

"1. The sick, without being pained by a separation from their families, may be attended and relieved in their own homes.

"2. The sick can, in this way, be assisted at a less expense to the public than in a hospital.

"3. Those who have seen better days may be comforted without being humiliated; and all the poor receive the benefits of a charity, the more refined as it is the more secret."

What Is the Practicing Physician's Role?

Organized home care is not considered to be a medical care program designed to replace or supplant the services of the private physician or the family doctor. At the present time, the development of home care is directed primarily toward the health problems of nonambulatory indigent and medically indigent patients. It would, however, appear that the development and provision of adequate supportive services in the community could be of inestimable value to the practicing physician and his patients.

Home care programs offer the possibility of a higher grade of medical practice than is presently possible. This becomes apparent when we consider the chronically ill private patient who is financially able to pay for all or part of his care, and who, while requiring some supportive services, does not need the 24-hour services of a hospital or institution. Today, even though his physician could adequately provide medical care services in the home, the patient has difficulty in receiving supportive services at a reasonable cost if, indeed, he can receive them at all. As a result, many patients are obliged to enter hospitals or other costly institutions which, in many instances, are physically and psychologically less pleasant than the home.

We should anticipate considerable future readjustments designed to encourage a broader application of home care principles, not only with regard to the medically indigent but also in relation to those patients who are able to pay for all or part of their care. We should also anticipate general modification of voluntary health insurance plans and benefits based on the obvious advantages of home care for many subscribers and their physicians.

What Structure and Organization Is Entailed?

In order to provide acceptably complete and adequate service, a home care program should have at its disposal the services and resources of a general hospital.

It should be able to make coordinated use of such community resources as health, welfare, and social agencies.

There must be integrated cooperation among professional personnel engaged in the program.

The program should have specific geographic limitations.

The program must have adequate financial support.

There must also be centralized administrative responsibility for the program. Such responsibility may be localized in a variety of agencies. For instance, in Philadelphia, the Visiting Nurse Society has served as the voluntary health agency through which an organized home care program has been developed. In Richmond, Va., the health department has developed a citywide program in cooperation with the Medical College of Virginia. Hospital-centered, the program financially is supported principally by the health department, with the medical school financing that part considered to be educational. In Chicago, the department of public welfare arranged home care services for its clients. Montefiore Hospital (New York City) provides care to selected long-term patients who may be transferred to the hospital when necessary. The Massachusetts Memorial Hospital and the Boston Dispensary provide medical care for both short- and long-term patients. Medical services have been coordinated through social agencies as in the Jewish Community Services of Queens, New York City.

Auspices which contribute to the development of home care programs vary from community to community. Health departments, departments of public welfare, medical societies, voluntary health organizations—a virtually limitless number of combinations can spark the provision of a program.

Does the Health Department Have a Stake?

The position of the local health department in the field of chronic disease control was de-

fined in 1950 by the American Public Health Association (4):

"As new programs of public medical care are developed, their administration can logically be entrusted to the local health department. The well-organized and adequately staffed local health department is fitted for this task because of its strong combination of medical and organizational skills, its accustomed responsibility for a public trust, its emphasis on promotion of health and prevention of disease, and its understanding of the organizational elements required to achieve a high quality of care."

In many existing programs, preventive and curative services have been combined to a considerable extent. Prevention of the progress of a disease—the basic reason for early case finding—has resulted in the merging of public health and clinical laboratories. Public health and bedside nursing programs have been combined. Public health nurses are being utilized for the followup of discharged hospital patients. This combination of preventive and curative services is essential in present and future approaches to disease control.

The combination of services may, in many areas, represent a break in health department tradition. In communicable disease control, the health department was not generally concerned directly with the provision of medical services to sick people. From this point on the health department must be concerned if it is to keep its place as a functioning part of the American community. By its very nature, chronic disease is allied with the need for medical and nursing care. More and more frequently, that medical and nursing care will be arranged for, or supplied by, the local health department.

What Kind of Patient Is To Be Taken Care of?

Home care programs should provide services of a general nature and should not be limited to a particular disease category or type of disease. The kind of patient acceptable for home care depends upon criteria established by the community, both for acceptance requirements and for the kinds and amounts of service that will be offered. All kinds of patients are being

cared for at home: the acutely and chronically ill of all ages and all diagnostic categories.

What Are the Minimum Services Necessary?

The chronically ill home care patient needs the care and guidance of a personal physician. The physician functions as the leader of the medical care team, outlines the plan of treatment, and gives specific orders for the patient's care which can only be carried out under his guidance and direction. For special needs, specialist consultation should be available. In this area, a hospital or medical school program can draw upon especially assigned consultants or upon staff or faculty members. Where this is not practicable, the health department can make arrangements for specialist consultation on the advice of the physician in charge.

As chronic disease programs develop, public health agencies will need to revise their policies and provide a sufficient number of public health nurses to include nursing care of the sick at home. It is the public health nurse who will determine the nursing needs of the patient with a chronic illness. She will give and supervise indicated care. She will teach the patient and his family how to deal with the specific chronic disease problem in the home. When necessary, she will make arrangements with a responsible person (usually a family member) for round-the-clock care. She will direct the treatment prescribed by the physician and encourage the continuance of medical supervision as long as necessary. She will give special treatments such as enemas, irrigations, catheterizations and inhalations, and she will be available for special services during pregnancy. She will also help the patient live within his limitations to his full capacity through the use of proper rehabilitation techniques.

Moreover, because of her visits to the home, the nurse will be in the best position to note the family's needs and to make referrals for medical and social services. She will also be able to observe conditions affecting family and community health and to bring them to the attention of the proper authorities.

The social worker is also essential to a home care program. Her knowledge of the social needs of the patients—housing, financial, emo-

tional—makes it possible for her to refer them to the various community agencies that can help them. By pointing out special social needs of the patient, the social worker makes it possible for social agency programs to meet those needs. An example is the recommendation for increased food allowances to prevent further illness or disability.

She will also, of course, give direct casework service when necessary. One of the benefits of this service will be the help given to patients and families in adjusting to individual situations created by the presence of a sick person in the home. Through her knowledge of community resources, she will help to integrate these services with other services being provided to patients so that patients may receive more adequate and more understanding care.

Provision of medications and appliances is necessary to any effective home care program. These should be made available on the order of the physician. They may then be obtained by the patient, or they may be provided by the health department or through public and private agencies.

The services just discussed are necessary for the establishment of any home care program. Expanded programs—which will come as experience is gained and as personnel become available—may include the following services:

Housekeeper service is usually supplied by a family agency or by a religious order. The housekeeper must be a person competent to manage a home and children under the active supervision of the caseworker. Her duties might include marketing, cooking, cleaning, mending, and such services to the patient as changing bed linen, giving bed baths, and serving food. To perform these duties efficiently, the housekeeper should have special training in home management, budget, nutrition, and child care. She should also have an understanding of behavior and attitudes.

The nutritionist can make an invaluable contribution in a number of home care cases by proper dietary planning.

Physical medicine and occupational therapy depend upon early inception for success. There is a personnel shortage in this field, so the nurse will probably be responsible for carrying out therapy prescribed by a physiatrist.

Emphasis should be placed on self-care procedures, and the family should be trained in giving treatment to the patient.

Dental care is important in the preventive and rehabilitative aspects of certain illnesses. Emergency dental care should, therefore, be incorporated into the home care framework.

It is apparent, then, that adequate home care requires the combined efforts of welfare, medical, vocational, and guidance services. These services should be available to all who need them. A careful review of those organizations that provide home care in some degree will make apparent home care services available in the community.

What Are the Costs?

Discussion of costs in relation to home care is, of necessity, highly theoretical. Differences in methods, variations in services, and differing techniques make it impossible to offer a definitive statement. Costs can be figured on cost per patient, cost per patient visit, and cost per patient-day. Results, of necessity, vary according to the method used. In some places, home care is less expensive than hospital care. In others, it is more expensive. This, however, is not the important factor.

The quality of home care should at least equal hospital care. It can be superior to hospital care. It is an error to insist on thinking of home care only as a moneysaving device. The importance of home care lies in the fact that in many instances the patient will be better taken care of. Properly used, with the proper motivating philosophy, home care is better for many patients—medically, financially, socially, and emotionally—than hospitalization. And the patient is the subject of primary concern in any program of health.

How Is a Home Care Program Organized?

Many factors must be considered in setting up a new, or in expanding an established, home care program. The first step is to identify the needs which the program is to meet in the community. When the needs have been assessed—when the resources have been examined—the

necessary services to be furthered will be apparent, as will the gaps in community resources that must be filled.

In estimating the need for home care, every effort should be made to explore all of the sources from which patients may be drawn: at home; outpatient clinics; general hospitals; special hospitals; mental institutions; tuberculosis sanatoriums; nursing homes; convalescent homes; homes for the aged. When the needs are known, the program can be adjusted to the available funds, facilities, and personnel.

It is recognized that many health departments face the problem of knowing that they do invaluable work, but that that work is frequently intangible. It has become so much a part of the community background that it is taken for granted. People never think, for instance, of the fact that their water is pure until it becomes polluted. In this context, it is probable that once a home care program is launched—that once the community again becomes aware that its health department is making better health a tangible, easily seen reality in relation to the families that form the community—it will have overwhelming support. When that support is gained, expansion will be no problem. It will be demanded.

At this particular time, however, when practicality is a necessity, home care programs offer many advantages:

They meet the medical care needs of the home-bound patient.

They decrease the length of hospital stay.

They diminish expenditures for the construction of additional hospital beds.

They provide continuity of service.

They create an opportunity to apply preventive measures effectively.

They function as a case-finding tool.

Basically, it does not matter whether the operating agency for a home care program is the community's general hospital, the local health department, or some other responsible community agency. The program will succeed if it meets a need and if community resources are effectively utilized. Those resources will be effectively utilized as the community recognizes that home care is a service that will benefit the community in every aspect of its health and welfare.

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Emergency Medical Force Sent to East Pakistan

An emergency medical force composed of 6 Public Health Service scientists and 80 Army medical corpsmen was sent to East Pakistan in mid-August to assist the country in meeting the threat of post-flood epidemics. Head of the force is Dr. Alexander D. Langmuir, chief epidemiologist of the Public Health Service's Communicable Disease Center, Atlanta, Ga.

Reports from Pakistan to the Foreign Operations Administration indicate that 7 million persons have been left homeless or seriously affected by the unprecedented floods occurring this year. The primary concern of the Pakistan Government is the threat of major epidemics of typhoid fever, dysentery, cholera, and malaria, all of which thrive in postflood conditions.

Missouri Drainage Basin Program for Control Of Water Pollution

By CARL E. SCHWOB, M.S.,
and GLEN J. HOPKINS, M.P.H.

THE TEN State health departments in the Missouri River Drainage Basin have agreed on a regionwide water pollution control program—the first major river basin program to be adopted by the Public Health Service as meeting the requirements of the Federal Water Pollution Control Act of 1948.

Damage to water resources has been one of the costs of the country's tremendous progress. This fact was recognized by the Congress in the enactment of the Federal Water Pollution Control Act of 1948. The Public Health Service, as part of its responsibilities under this act, must prepare or adopt, in cooperation with State and interstate water pollution control agencies, other Federal agencies, municipalities, and industries, comprehensive programs for the abatement of water pollution.

In the Missouri River Drainage Basin, a series of sub-basin reports was prepared cooperatively by the States and the Public Health Service, presenting information concerning water uses, types, amounts, and resulting damages of waste discharge, benefits that would accrue from pollution control, pollution prevention measures in effect, and pollution control measures required. The comprehensive pollution control program for the Missouri River

Mr. Schwob is chief of the Water Supply and Water Pollution Control Program, Division of Sanitary Engineering Services, Bureau of State Services, and Mr. Hopkins is the officer in charge, Missouri Drainage Basin Office, Public Health Service.

Drainage Basin developed by the 10 State water pollution control agencies was subsequently adopted by the Surgeon General of the Public Health Service.

Five other programs covering smaller areas have been adopted, and many more are in the process of development. Each comprehensive program is intended to provide to the citizens of the area, to city officials, industrial leaders, farmers, fishermen, and others, an objective plan based upon good engineering practice and reflecting sound economics. They are plans which the public should support if progress is to be made in the abatement of pollution.

The Missouri basinwide water quality objectives take into consideration all water uses, including the use of streams for disposal of wastes after minimum treatment needed to protect other water uses. The published report of the program recognizes that citizens and industries of the basin must assume their rightful obligations and provide the needed pollution control facilities, and that effective legislation must be enacted in several of the States authorizing effectual control activities and the funds necessary to operate such a program. The importance of public understanding of the need for pollution abatement, enforcement of laws, and financing of abatement works is stressed.

Facilities and Needs

There are 1,073 municipal sewerage systems in the basin serving 3,955,710 persons. In addition, these systems carry industrial wastes equivalent to the wastes of 2,784,250 persons, or a total of 6,739,960 population equivalents of organic waste. Treatment of sewage is provided in 759 communities containing 70.7 percent of the population served by sewers. Treatment reduces the total biochemical oxygen demand of the wastes by 27.4 percent so that a population equivalent of 4,891,650 is actually discharged to the streams.

Of the existing treatment plants, 299 have inadequate capacities and 38 percent are not operated satisfactorily.

Industry not served by sewer systems contributes to watercourses 10,008,880 population equivalents of organic wastes from 332 separate sources. In addition, considerable chemical and inorganic wastes are discharged. Some degree of treatment is provided at 143 industrial establishments, but 54 percent of these treatment facilities are inadequate.

Silt pollution is recognized as an important segment of the overall problem. Its control involves agricultural, mining, and other interests.

Treatment needs as established by the respective State water pollution control agencies for municipalities are 319 new plants, 146 replacements, 82 additions, and 96 enlargements. For industry, the treatment needs are 172 new plants, 38 replacements, 26 additions, and 14 enlargements. The total of 893 projects, 643 municipal and 250 industrial, for the Missouri River Drainage Basin are conservatively estimated to cost \$186,000,000, excluding interceptors, maintenance, and operation.

Criteria for Needs

The treatment needs are based upon criteria adopted by the engineering section of the Missouri Basin Health Council, consisting of the State sanitary engineers of the 10 States, to guide pollution control programs in the basin. The criteria provide the following:

1. Toxic substances should be virtually eliminated from sewage effluents.
2. Removal of settleable and floating solids should be required as minimum acceptable treatment.
3. Industrial wastes similar in nature to sewage should be provided the same treatment

as municipal wastes. Industrial wastes not comparable to municipal wastes should be treated as necessary to prevent deterioration of stream water quality for beneficial uses.

4. Additional treatment over that specified in item 2 should be provided to protect downstream uses. Quality objectives for selected water uses include:

a. For water serving as a source of domestic supply, raw water bacteriological quality should conform to the specifications in the Manual of Recommended Water Sanitation Practices, 1946, Public Health Bulletin No. 296, pages 11-13.

b. For bathing waters, the monthly average MPN coliform organisms should not exceed 1,000 per 100 ml. nor exceed this number in more than 20 percent of the monthly samples, nor exceed 2,400 per 100 ml. on any day. For nonbathing recreational waters, the monthly average MPN coliform organisms should not exceed 5,000 per 100 ml. nor should exceed this number in more than 20 percent of the monthly samples.

c. For fish and aquatic life, minimum dissolved oxygen should not be less than 5.0 p.p.m., and for trout streams, not less than 6.0 p.p.m.

d. For irrigation waters used for forage crops, sewage treatment should reduce coliform bacteria by not less than 90 percent. For waters used to irrigate human food crops, treatment should insure reduction of suspended solids, biochemical oxygen demand, and coliform organisms of not less than 75 percent, 75 percent, and 98 percent, respectively, unless minimum dilution is at least 10 times the maximum sewage discharge, in which case bacterial reduction of 90 percent may be acceptable.

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Venereal Disease in Agricultural Migrants

—New Jersey, 1953—

By ADELE C. SHEPARD, M.D., M.P.H., and WILLIAM J. PAGE, Jr., B.A.

ACH YEAR there is a seasonal movement of migrant laborers in the United States along three principal migratory streams. These three broad patterns generally correspond to the agricultural belts of the country—the eastern seaboard, the Mississippi River Valley, and the Pacific seaboard. In 1950, the Federal Government, recognizing the multiplicity of problems associated with these workers, established a commission (1) to study the circumstances under which they live and work. The commission conducted hearings in Trenton, N. J., and in 10 other major cities in areas of the United States which employ migrant laborers. In 1951, it made recommendations to the President, proposing changes in administration and legislation that would benefit migratory farm workers, farm employers, and the public.

The Migrant Population

An estimated 16,000 migrant agricultural workers enter New Jersey annually. It is vir-

tually impossible to establish their numbers with accuracy because of the variety of types of workers, their wide geographic distribution in the State, and their multiple points of origin. Among these migrants are a few hundred Jamaicans and approximately 10,000 Puerto Ricans. Farmers, working through State and Federal agencies, effect agreements with Puerto Rican and Jamaican authorities under which workers are recruited, transported to the mainland, and returned at the end of the contract period. These groups of exotic laborers contribute little to the State's venereal disease problem since, as a rule, an examination before entry into the United States screens out venereally infected individuals.

However, hundreds of Puerto Ricans who have not had the benefit of recent physical examination migrate to New Jersey from New York City and other adjacent areas. Many of these "walk-ins," as they are called in the farm labor market, originally came to the United States under a farm labor program or entered of their own accord and chose to remain. Work arrangements for the majority of Puerto Rican laborers, walk-ins and contractual personnel alike, are made through a single camp in Glassboro, which is operated by an association of farmers.

A large and homogeneous portion of New Jersey's migrant population is comprised of southern Negroes, and it is with this group that this report is primarily concerned. Having worked from Florida up the eastern seaboard with the progress of harvest seasons, these domestic migrants begin to appear in

Dr. Shepard is chief of the bureaus of venereal disease control and acute communicable disease control, New Jersey Department of Health. Mr. Page is health program representative in the bureau of venereal disease control. He has also served as venereal disease epidemiologist (interviewer), Public Health Service Medical Center, Hot Springs, Ark., and venereal disease investigator, South Carolina State Board of Health.

Cumberland, Salem, and Gloucester counties in June, and their numbers gradually increase throughout the agricultural areas until August, the peak month of vegetable harvesting activity. Few Negro migrants are found farther north than Monmouth and Middlesex Counties in central New Jersey. While some of them may remain permanently, they largely disappear from the State by the end of September.

Health and Welfare Problems

The migrant labor group contains some complete and some partial family units and brings with it a wide variety of health and welfare problems. About 65 percent of the group are males and the average age is approximately 30 years. Poverty and rootlessness, impersonal relationships, and insecurity characterize their circumstances. The nature of their living conditions, their personal anonymity, their lack of community organization encourage serious compromises with acceptable social and moral standards. Housing facilities often require that two or more families live in a single one- or two-room cabin or even in available barn space. Wages are so low (less than one-half the rate for industrial employment) that very few New Jersey residents will perform the "stoop labor" required of migrants.

The contractor or crew leader, as he is sometimes called, enters into an agreement with one or more farmers to harvest potatoes, tomatoes, and other crops on a "piece-work" basis. The contractor pays workers at a rate fixed by him. Since the urgency of hand-to-mouth economy is always present, contractors may be heavy-handed and workers are often disappointed in the remuneration they finally receive for work completed. Other migrants, known as "free-wheelers," operate as individuals or in small groups and are paid directly by the farmers for their work. In either case, migrants are employed only sporadically. According to a survey conducted by the United States Department of Agriculture, the average migratory worker in the United States in 1949 performed only 70 days of farm work. Surveys have shown that employment potentialities for such workers are at least 200 days of employment in a year.

It is under these circumstances and in this unfortunate population group that we have found the greatest prevalence of venereal disease of all groups studied.

Venereal Disease Clinics

In 1945, New Jersey enacted a law (2) which requires that any migrant laborer who cannot show satisfactory evidence of examination for venereal disease having been performed within 90 days prior to entering the State must submit to such examination within 30 days after entry. Moreover, the law requires that employers of migrants notify the State department of health within 5 days of the commencement of employment whether or not their workers have been examined.

Long before the passage of this law, clinics for the examination and treatment of migrant agricultural workers were maintained at strategic points throughout the State. The enactment of the migrant labor law appeared to have little effect on the numbers of migrants attending clinics. In 1952, there were 1,910 such persons examined for venereal disease.

During the period July 17 through September 9, 1953, there were available for the examination and treatment of farm migrants 4 clinics in permanent locations and a mobile unit which had previously served as a chest X-ray clinic. With 5 clinic sessions per week in the permanent sites and 5 sessions provided by the mobile unit, there were 10 clinics held every week during the period of peak migration into New Jersey.

Working from spot maps, advance men attempted to contact personally each farmer employing migrants and the contractors concerned. They were advised of the exact time and place that a given crew was expected to attend a clinic. The mobile unit was scheduled in such a manner as to cover the largest concentrations of migrant population. A centrally located farm or other place was selected as the site for the unit so that few individuals were required to travel more than 3 or 4 miles to obtain an examination.

The clinics were staffed with physicians, nurses, technicians for drawing blood, venereal disease interviewer-investigators, and clerks, the numbers of each being dictated by their

Table 1. Results of serologic tests for syphilis, by age groups.

Age groups	Total tests	Number positive	Number doubtful	Percent positive and doubtful
All ages	1 3,170	414	385	25.2
Under 15	160	7	3	6.2
15-24	1,028	69	40	10.6
25-34	857	124	125	29.1
35-44	585	113	110	38.1
45-54	338	62	72	39.6
55-64	111	26	22	43.2
65+	22	3	7	45.5
Not stated	69	10	6	23.2

¹ Excludes 231 specimens from Orchard Center-Gelston Village clinics, for which data are not available.

availability and the anticipated needs of a given clinic session. The key persons in the conduct of the program were the specialized venereal disease personnel on the staffs of the bureau and the district State health offices. They performed the duties of program coordination, scheduling and advance work, bloodletting, interviewing and investigating, and actual door-to-door canvassing just before and during clinic sessions to assure attendance at the clinics.

In most instances the staff was hard pressed to perform the tasks of physical examinations, necessary referral services, and contact inter-

viewing of infected patients. During the summer, crews of laborers often work until nightfall. Even though clinic sessions were scheduled from 7:30 to 10:30 in the evening, and in spite of specific appointments, patients arrived in large numbers between 8:30 and 9:00 p. m., a circumstance which limited the time during which they could be tested and examined.

Diagnosis and Treatment Policies

Patients were examined according to policies established by the bureau of venereal disease control. All persons over 12 years of age were tested serologically for syphilis. Some compromise in the matter of physical examination and diagnosis was inevitable due to the large numbers of patients processed during short clinic sessions and to the transient nature of the group. An inspection of mouth and genitalia was ordered on all males. All females with positive serologic tests for syphilis (STS); all contacts, male or female, to cases of venereal disease; and all individuals complaining of or manifesting obvious signs or symptoms of venereal disease had a more complete examination.

A presumptive diagnosis of venereal disease was permitted on the basis of objective clinical findings or one positive or doubtful result on STS. No spinal fluid examinations were done.

Table 2. Cases of venereal disease diagnosed through serologic tests and physical examination by migrant health clinics

Clinic	Total cases of venereal disease diagnosed	Brought to treatment						Previously adequately treated for syphilis	
		Syphilis				Gonor- rhea	Other venereal disease		
		Total	Primary and secondary	Early latent	Other				
All clinics	1 967	340	19	135	186	198	4	66	359
Orchard Center-Gelston Village	9	0	4	5	5	1			
Freehold	134	55	0	10	45	24	0	16	39
Prospect Plains	206	89	4	33	52	29	1	23	64
Mobile unit	612	187	15	88	84	140	2	27	256

¹ Does not include cases returned to treatment or previously adequately treated for syphilis at Orchard Center-Gelston Village clinics.

Table 3. Results of investigation of persons with positive or doubtful results of serologic tests for syphilis

Clinic	Total suspects investigated	Suspects examined		Suspects not examined, by reasons		
		Number	Percent	Moved out of jurisdiction	Cannot locate	No disposi- tion after 30 days
All clinics ¹ -----	799	764	95.6	10	20	5
Freehold-----	120	110	91.7	1	9	0
Prospect Plains-----	194	183	94.3	0	6	5
Mobile unit-----	485	471	97.1	9	5	0

¹ Excludes Orchard Center-Gelston Village clinics.

Because of the unique followup problem which the mobility of migratory labor introduces, single-treatment schedules were recommended. For syphilis, 4,800,000 units of procaine penicillin in oil with 2 percent aluminum monostearate (PAM) were given in a single administration of 1,200,000 units at each of four sites in the buttocks. The treatment for gonorrhea was 600,000 units of PAM. All contacts of primary and secondary syphilis and of gonorrhea were treated prophylactically. When an individual with a positive or doubtful result on STS gave a fairly reliable history of previous treatment, he was not required to return for re-treatment.

Evaluation of Control Program

Tables 1-4 summarize venereal disease control activity in the migrant health program during

the summer of 1953. Nearly 65 percent of the individuals tested were under 35 years of age with the greatest number falling into the 15-24 age group (table 1). Because of this preponderance of young, sexually active individuals, it is not surprising that 19 cases of primary and secondary syphilis, 135 cases of early latent syphilis, and 198 cases of gonorrhea (table 2) were found in this survey of 3,401 persons. Of 3,170 blood tests on which complete data are available, 799, or 25.2 percent, were reactive for syphilis (table 1). Using the Mazzini test, 414, or 13.1 percent, were distinctly positive, with results of 3 plus, or greater, in the undiluted serum.

Tables 2 and 3 indicate program activity for each of the clinics for migrants. Very few data were available from the Orchard Center-Gelston Village clinics. Table 3 shows that practically all persons who had positive tests for

Table 4. Results of venereal disease contact interviewing and investigation

Diagnostic categories	Number patients interviewed	Contacts obtained	Contact index	Investiga- tions assigned ¹	Results of contact investigation		
					Number exam- ined	Infected with dis- ease of patient	Given pro- phylactic or epidemi- ological treatment
Syphilis:							
Primary and secondary-----	15	48	3.20	7	6	2	2
Early latent-----	29	99	3.41	6	6	3	0
Other-----	1	1	1.00	1	1	1	0
Gonorrhea-----	121	153	1.26	128	99	43	49
Other venereal disease-----	2	5	2.50	0	0	0	0

¹ Difference between these figures and contacts obtained represent out-of-State referrals for which no results are available.

syphilis were returned for examination. Those who had left the State were referred to out-of-State health departments for investigation. The exceptionally high proportion of individuals returned for evaluation was the result of two factors: followup within 36 hours after testing and followup by the same person who referred the migrant to the clinic for his initial examination. A significantly larger proportion of patients examined in the mobile unit had clinical symptoms of infectious venereal disease than did those seen in permanent clinics (table 2). Of the 608 cases of venereal disease treated in all clinics, 356 were communicable or potentially so. These figures represent an inordinately high incidence and prevalence of venereal disease.

The difficulties imposed by transiency of the migrant group, crowding at clinic sessions, and shortages of personnel made it expedient to emphasize serologic testing and examination of as many persons as possible rather than complete epidemiological followup. The objective of the contact interview with gonorrhea patients was to identify those sexual contacts who were known to be in New Jersey. Marital partners comprised the majority of the 25 gonorrhea contacts referred to other States (table 4). An effort was made to elicit information about all contacts of syphilis patients regardless of their whereabouts. The ready accessibility to the clinic of female gonorrhea contacts created a unique interview-investigation pattern. Since crews often attended a clinic en masse, females named as contacts by males could often be sum-

moned by name and treated epidemiologically immediately following the interview.

Summary and Conclusions

1. An estimated 16,000 migrant laborers were employed in agriculture in New Jersey during the summer of 1953.
2. Of an estimated 6,000 domestic Negroes in this labor force, 3,401 were tested serologically for syphilis.
3. Notwithstanding the bias in age, color, sex, and socioeconomic factors, venereal disease incidence and prevalence among migrants employed in agriculture is extremely high.
4. On the basis of the results obtained by surveying this group, it is recommended that serologic surveys and other control measures be expanded wherever possible to include the entire domestic migrant population.
5. A mobile clinic is more effective than the conventional type of clinic in reaching the farm migrant group.
6. This program of intense diagnostic and therapeutic effort among a selected population group was, we believe, epidemiologically successful, efficient, and economical.

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Departmental Announcement

George P. Larrick has been appointed Commissioner of Food and Drugs, Department of Health, Education, and Welfare, to succeed Charles W. Crawford, who retired on July 31, 1954.

Formerly deputy commissioner of the Food and Drug Administration, Mr. Larrick as commissioner will direct the administration and enforcement of the Federal laws regulating the purity, safety, and truthful labeling of foods, drugs, medical devices, and cosmetics shipped in interstate commerce.

Mr. Larrick entered the Federal service in 1923 as an inspector for the Bureau of Chemistry, which later became the Food and Drug Administration. He served successively as administrative assistant from 1928 to 1930, as senior inspector from 1930 to 1939, as chief inspector from 1939 to 1945, and as assistant commissioner from 1945 to 1948. He became associate commissioner in 1948 and deputy commissioner 3 years later.

Air and Stream Pollution Control In Harris County, Texas

By WALTER A. QUEBEDEAUX, Jr., Ph.D.

DURING World War II the gulf coast area, especially around Houston, Tex., became industrialized. As many of the industrial plants started to operate before proper waste control equipment was installed, air pollution resulted. At the end of the war, materials were available again, and it was felt that industry should take steps to control their waste products.

Air pollution abatement was badly needed in the area. Since the larger industries had located mainly along the Houston ship channel, which stretches 70 miles from the inland metropolis to the gulf, the prevailing winds caused certain plants to affect a particular area more or less continuously. One physician from this area stated that whenever the wind blew from the east, he could expect to have an average of 20 patients with bronchial inflammation when ordinarily he had 3 or 4. While the concentration of the pollution was not as great in the entire area compared with other localities, the amounts found downwind from many of the plants were locally greater. Therefore, severe fumigations occurred in small areas and resulted

in damage to vegetation and human suffering.

It was at this stage that the subject of air pollution came dramatically to the attention of the Texas State Department of Health in the fall of 1951 on the receipt of a petition containing some 5,000 signatures from a group of citizens who lived in a small community, Greens Bayou, near Houston. Since this particular locality is developing into one of the largest industrial centers in the country, the State agency felt that it would be better to start air pollution abatement before it became a more serious problem.

Geographic Considerations

Meteorologically, the gulf coast area presents a different picture from that of the classic conditions of Los Angeles, Denver, and other areas. The terrain is essentially flat and the wind is predominantly prevailing according to seasonal variation. Temperature inversions occur about 180 days out of the year and extend from below Corpus Christi, Tex., to Lake Charles, La., and as far inland as San Antonio, Tex.

During these inversions, the stack effluent travels as a mass along the ground at about 3-5 miles per hour without much lateral mixing. Under these conditions, the usual stack height formulas are not applicable, and several industries in this area have found tall stacks undesirable as a means of reducing ground level

Dr. Quebedeaux is the director of the stream and air pollution control section of the Harris County Health Unit, Houston, Tex. This paper is based on material presented before the American Industrial Hygiene Association meeting in April 1953.

concentrations. Also, since the plants are strung out along the ship channel from Houston to Galveston, it is easy to travel parallel roads and determine the exact width of the various plant stack plumes. With some experience, one can identify with certainty the source of a particular odor. Hence, the problem is immediately resolved into collection of the pollutants at the plant site rather than use of higher stacks.

Legal Provisions

Texas follows the common law as handed down from England except where specific provisions have been made by legislative action. Under this practice, it is a well-established doctrine that every person is entitled to a reasonable enjoyment of life and property, but he must so use his own property as not to cause injury to others. He is absolutely bound to conduct himself and to exercise what are regarded as his natural or personal rights so that he does not interfere unnecessarily or unreasonably in the exercise of rights common to all citizens. Every breach of this obligation has been held to be a nuisance. In addition, there are several laws in both the Penal Code and the Civic Statutes, as well as the Texas General Sanitation Law of 1945, which regulate and prescribe the method of abating nuisances. Also, the State health officer has the authority to quarantine or isolate any condition which affects the health of the public.

There are numerous cases in the records of the courts of Texas which extend the legal terminology covering nuisances and are rather specific in the decisions which are handed down. For instance, "When a business, lawful in itself, becomes obnoxious to neighboring dwellings, rendering their enjoyment uncomfortable by smoke, noise, offensive odors, or otherwise, it is a nuisance which equity will restrain" (1). This was a case decided against San Antonio, Tex., involving the proposed construction of garbage incinerators.

In another instance it was decided that "Where a cotton gin near a residence is a nuisance in that it interferes with the comfortable enjoyment of the residents, the owner, while not residing there, is entitled to injunction

against the nuisance" (2). Neither the fact that the trade is lawful, nor that it is needful, nor that the injury is unavoidable in the exercise of the trade, will excuse its operation in a locality where it inflicts actual injury on others, and that place for the operation of a trade is a convenient one, under the law, only when it is carried out where no injury results to others from it.

Coupled with these decisions is the one handed down by the Supreme Court of Texas in 1951, holding that "Where the tortious acts of two or more wrong-doers join to produce an indivisible injury, that is an injury which from its nature cannot be apportioned with reasonable certainty to the individual wrong-doers, all of the wrong-doers may be held jointly and severally liable for the entire damages and the injured party may proceed to judgment against any one separately or against all in one suit" (3).

By this last decision, it is not necessary for a complainant to prove the percentage of damage from any particular source. He may file suit against all suspected plants without dividing their responsibility. Therefore, under the statutes and court decisions in Texas, it has become relatively easy to obtain relief through the courts if desired.

Public and State Interest

As more and more of the citizens became interested, committees were organized and charged with the duty of obtaining pollution abatement through the various State agencies. The committees handled the work of collecting the signatures of complainants in a local area and transmitting the petitions to the Governor or State health officer with requests that these officers use their power under the State constitution to bring about corrections in the operating methods of the offending industries. These committees also conferred with the management personnel of the various plants and in some instances were able to obtain cooperation so that the plant took steps to reduce its individual pollution.

The State agencies, primarily the State health department, made exhaustive investigations to determine the sources of the air con-

taminants. The principle on which the abatement problem was attacked was that each plant should reduce its individual pollution to some extent even though, in comparison to another plant, this pollution was relatively minor. On this basis, all plants were expected to tighten their operation procedures, make use of collection devices, and to refrain from unnecessary release of contaminating materials.

In Harris County it was decided that instead of using a definite concentration of the noxious contaminants to be allowed in the stacks, the principle of allowing only that amount which did not materially affect the residents in close proximity to the plant was to be followed. In other words, it was not material whether or not a given plant expelled 10 or 100 tons of sulfur dioxide per day, but it was necessary to determine whether these amounts would give undue discomfort to the local residents.

Complaints from citizens had to be checked carefully by engineering personnel to determine their validity. However, as each plant started collecting its own pollutants, it was found in most instances to be easy to reduce pollutants to a point that abated the nuisance to neighbors.

The Program

In order to accomplish abatement of air pollution, the following program was evolved by the Texas State Health Department and the Harris County Health Department.

1. Open hearings were held by the State health officer. Both citizens and representatives of industry were invited to state their opinions on the conditions in the area. A record was made of the proceedings for study and distribution by the health department.

2. Meetings with industrial committees of the chamber of commerce were held and served to focus the attention of this civic group on the need for air pollution abatement; to inform industry through its top executives, who were members of these committees, of this situation; and to obtain help in forcing the few recalcitrant industries to cooperate with the health department personnel in solving their particular problems.

3. Representatives of industries known to be producing considerable pollution were invited

to conferences with the health department personnel to discuss their air pollution problems. At these conferences, the type of problem of the particular industry, the manner in which the management proposed to solve their problem, and their estimate of the time required to have the necessary equipment installed and in operation were determined. Included also was a discussion of the connection between their air pollution problems and any subsequent stream pollution which could result from improper handling of their liquid wastes. Finally, each industry was given the recommendations of the health department engineers. The recommendations were fully discussed along with reasons for such suggestions.

It was possible under the 1953 program, by cooperation with industry and interested citizen groups, to eliminate much of the industrial air pollution. Some plants had completely solved their problems; others were well on the road toward completing the installations which would remove the contaminants emitted to the atmosphere.

The relationship between industry and the health department personnel is quite cordial. In one particular plant where the health department insisted upon the installation of 2 bag-type dust collectors on automatic filling machines, it was found that each collector recovered 4 tons of material per day. This material is valued at \$100 per ton by the plant and retails for approximately twice that amount.

Another plant was using the air to dispose of fluorides which it had considered a waste product. This plant found that the material collected more than paid for the installation of the dust-collection system. There are many instances of financial benefit to plants from the installation and use of control equipment suggested by the health department engineers.

Plants which were given individual conferences by the health department engineers were reinspected after 3 months to determine the plants' true attitude toward cooperating in abating their air pollution and to determine what had actually been accomplished in the installation and construction of the necessary collection devices. It was found that about 50 percent of the plants were actively engaged in solving their particular problems, 41 percent

were still just talking, and only 9 percent actually did not intend to do anything.

Health Department Reorganization

Unfortunately for the air pollution work in Harris County, there was a change in personnel in the State health department and there was no one available to help carry on this work. Also, the county commissioners refused to allocate funds for air pollution control although they did organize a stream pollution control group instead of continuing the use of an outside consultant. The budget for this group was \$18,000 and included the employment of one engineer, one assistant engineer, and a biologist. Laboratory work was to be done at the regional State health department laboratory. Work accomplished by this group in the 9 months ending December 1, 1953, was as follows: 60 streams and bayous sampled; 96 sewer plants surveyed; and 4,350 laboratory analyses performed.

On December 1, 1953, \$10,000 was added to the remaining stream pollution budget and a combined stream and air pollution control section was formed. A separate laboratory, furnished with up-to-date equipment was organized and 2 engineers, 1 chemist, and 1 secretary were employed. The actual laboratory analyses for the first month were done at the State health department regional laboratory.

In order that no conflicts would be encountered between the authorities of the stream and air pollution group, the Houston industrial hygiene section, and the local office of the State health department industrial hygiene engineer, it was mutually agreed that the stream and air pollution group would concern itself with public nuisances and conditions caused by plant effluents after they left the plant property. In other words, the two industrial hygiene agencies were to work on inplant problems while the stream and air pollution control section considered things on an outplant basis. During the month of December the following work was accomplished: 2 streams and bayous were sampled; 2 sewer plants were surveyed; and 86 laboratory analyses performed. But for the most part, time was spent by the entire group in arranging the new laboratory and installing new equipment.

With the start of 1954, laboratory facilities were enlarged so that all the samples collected could be handled and the personnel could be combined into a better organization. The county commissioners' court voted a \$45,000 budget to cover the cost of operation of this section. Financial aid was given to the plan on a per capita basis by 17 municipalities in Harris County. Under the program for combating stream and air pollution in Harris County it was planned to include the following steps:

1. Stream sampling schedules were made to include collection of samples from every stream in Harris County each month.
2. The number of laboratory tests was expanded to include more specific analyses for industrial wastes.
3. Conferences were begun with industries to determine their progress toward eventual abatement of stream and air pollution.
4. A system for handling air pollution complaints was devised so that an immediate investigation could be made and a permanent record of the incident kept on file.
5. Abatement notices were to be issued when necessary to accomplish correction. For the most part these involved incidents in which it was possible to achieve the correction in a relatively short period of time.
6. Systematic recheck was to be made of the progress accomplished by the various plants in abating stream and air pollution.

During the first quarter of 1954 the following was accomplished: 43 streams and bayous sampled; 3,447 laboratory analyses performed; 108 complaints received and investigated; 24 industrial conferences held; 13 abatement notices issued; and 10 abatement notices complied with.

In comparing air pollution conditions existing at the end of the first quarter of 1954 with the same period in 1953, we found that of the 26 plants contacted during the first quarter of 1954, 31 percent have completely abated their pollution; 19 percent have installed equipment that will partially solve their pollution problems; 46 percent are organizing pollution control groups; and only 4 percent are still unwilling to cooperate. Thus, resistance to pollution abatement in Harris County has diminished considerably in the past year and progress is being made.

Planning for the Future

In planning for the future, we feel that we will always need a stream and air pollution control section to monitor the operations of existing plants and serve as consultants in the planning stage of new plants. The Harris County program will probably be continued, but personnel should be increased by at least 1 engineer and 2 chemists. This enlargement is becoming more necessary since the people within the county have found a group who try to obtain correction involving the industrial plants.

We have been flooded with complaints which require practically 24-hour duty on the part of some of our group. Also, it is becoming apparent that the use of the industrial conference, in which the plants' representatives meet with the stream and air pollution control section to discuss ways and means of abating their problem,

is the mainstay of the program. The handling of this portion of the work also requires practically the full time of one engineer and a secretary. This does not leave personnel available for actual plant inspections in the field. These inspections should be started and carried on as a routine measure to check on information supplied to our group by the plant's representatives. We believe that our group has progressed considerably in the short time of its existence and hope that we can continue at the same rate of progress.

REFERENCES

- (1) *City of San Antonio v. Hamilton*, Civ. App., 180 S. W. 160.
- (2) *Faulkenbury v. Wells*, 28 Civ. App., 621, 68 S. W. 327.
- (3) *Landers v. East Texas Salt Water Disposal Company, et al.*, 242 S. W. (2d) 236.

technical publications

Management and Union Health and Medical Programs

Public Health Service Publication No. 329. 1953. By Margaret C. Klem and Margaret F. McKiever. 276 pages; tables. \$1.

The third in a series of studies on health and medical services in industry, this volume describes the provision of medical care outside the plant for workers, and sometimes their families, under the sponsorship of employee organizations or management, or both.

The first two volumes in the series deal largely with facilities available to employees in plants. The first, Industrial Health and Medical Programs, is general. The second volume, Small Plant Health and Medical Programs, presents problems peculiar to small plants.

The first section of the present volume traces the development of employee health programs from the 19th century to the present. The development of workmen's compensation laws and the gradual extension of the laws to include coverage of occupational diseases are also discussed.

Section II defines the extent to which employed groups have medical protection through management-and union-financed programs and the types of benefits provided.

The third section describes methods of providing benefits and the characteristics of insurance company, Blue Cross, and Blue Shield contracts.

Section IV describes contract negotiations between management and labor for the provision of medical benefits and the various methods of financing and administering the benefits provided.

The fifth section describes in de-

tail several programs that have been developed to provide preventive and diagnostic services and in some instances treatment. Both the background and present status of these plans are outlined.

Appendices contain detailed information that may be of assistance to persons interested in or responsible for the development and direction of employee health and medical programs.

This section carries announcements of all new Public Health Service publications and of selected new publications on health topics prepared by other Federal Government agencies.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.

The Public Health Service does not supply publications issued by other agencies.

A SPECIAL SECTION

APHA SOUTHERN BRANCH CONFERENCE REPORT

Selected papers given at the 23d annual meeting of the Southern Branch of the American Public Health Association are presented in this section. The news-type coverage, giving the essence of the subject matter, follows the pattern of reporting the APHA annual meetings. The APHA Southern Branch conference, held in St. Petersburg, Fla., April 21-23, 1954, had as its theme, "So much to do for so little." Public health workers from Alabama, Arkansas, the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Tennessee, Texas, Virginia, West Virginia, and Latin American countries officially recognized as part of the territory of the American Public Health Association, constitute the APHA Southern Branch organization.

Hiscock Discusses Priorities In Vital Health Services

Changes and shifts in the amount of financial support for vital health services are inevitable, commented Ira V. Hiscock, Sc.D., professor and chairman, Yale University Department of Public Health. The challenge to the health profession lies in the "serenity to accept the things we cannot change, the courage to change the things we can, and the wisdom to know the difference," he indicated.

Many official agencies engaged in public health have had to undertake the painful process of adjustment after experiencing budget cuts, he continued. Whether actual or threatened, these reductions in "a basic element of progress" are forcing an overdue critical appraisal of resources, needs, and opportunities. Either readjustments and reorganizations are resulting, or essential services are being curtailed despite the previous yield of high dividends in terms of reduced illness, incapacity, pain, and unnecessary suffering, and in terms of increased health and happiness resulting from constructive preventive measures.

Even before budget cuts were threatened, Hiscock noted, increasing attention was being given by health departments to the return to individual practicing physicians of much of the treatment of gonorrhea and syphilis and to the ways to secure eradication of diphtheria and whooping cough and further reduction of tuberculosis and maternal and infant mortality. Some administrators cut unnecessary and unproductive individuals from their staffs and then cut vital services rather than using horizontal cuts to substantial levels. In one State, copies of birth certificates and laboratory services to physicians were cut, and "how they shouted!" he said.

"We who are engaged in public health feel that it is good business to maintain the health of the people so that they can pay taxes and re-

main off the relief rolls and continue to work as well as to enjoy life," Hiscock said, but he questioned whether bankers, businessmen, industrialists, and county judges and other local and State officials "believe these ideas or have been given the picture." There is room for improvement in concepts as well as in plans and programs, he said.

Priorities in Health Services

While numerous official appropriations from tax funds are being reduced, financial campaigns have increased for nontax support of several voluntary health agency programs. Many of these causes are worthy and essential, he stated, but noted that it is reasonable to ask how long the public will continue to respond to money-raising appeals when the causes are of varying significance and often lack features of cooperation and correlation and of effective joint planning and administrative guidance. "Are there priorities and principles involved in joint sharing of both the functional and fiscal responsibilities?" he asked. "What services and programs deserve priority consideration? Do we see the mandates of the people reflected in the mounting contributions for voluntary agencies?"

For example, technically skilled personnel for administering the voluntary health programs have not increased in a manner to keep pace with the promotion of financial campaigns, he pointed out. One top priority item is for more trained personnel for both official and voluntary health programs.

Hiscock said that it is gratifying to see how much progress has been made beyond the "so-called basic six services" of three decades ago—environmental sanitation, communicable disease control, maintenance of records for statistical purposes, health education of the public, maternal and child health, and public health nursing. "But do these terms mean people and neighbors to anyone but those of us who talk so much to

and with each other?" he asked. "Have measures for visibility been developed or demonstrated to show convincingly to health officers and county council managers and to those who hold the purse strings what health education, dental and mental health services, gerontology, nutrition and school health programs, as now conceived and operated, can offer in service and tangible results to individuals, families, and tax-payers?"

Far-reaching programs will require a resetting of priorities, he said, urging a determined, united effort to help complete the task of controlling tuberculosis, to reduce by over half the total of accidents, and to bring all modern resources of science to bear against rheumatic fever, cancer, arthritis, diabetes, and the heart diseases. Other priority programs he listed as "doing something more about dental health," an increase in the development of rehabilitation services to the handicapped, and the application of vigorous preventive measures to safeguard the health of mothers and children and to deal with the increasing problem of mental illness.

Flexibility in Planning

Hiscock suggested that constructive programs for public health should be dynamic and adaptable to changing health needs, which are of necessity influenced by conditions, duties, and occasions in a State or in the Nation. Furthermore, continual evaluation of existing State and local programs is necessary to assure the greatest possible degree of health protection and promotion for the people, he added, stating, "Budget cuts bring the issues more quickly to the surface."

Any review of human needs and resources will include an evaluation of government and voluntary activities, and their interrelationships, although rarely would services conducted by government be transferred back to voluntary agencies just because of budget cuts, he con-

tinued. "Certainly, budget cuts are a good handle to grasp for careful examination of the efficiency of administration and organization. We must admit that activities are sometimes carried on because they have been carried on in the past"—and also sometimes because of vested interests and complacency, he said.

A lesson can be gained from the depression years when much attention was given to economies in public health, he said. Evidence at the time showed that local economies lay chiefly in the integration of certain health activities with the work of other municipal departments, in the coordination of official and unofficial health services under the health officer, in a readjustment of local areas of health jurisdiction, and in the adoption of improved methods. Reduced personnel and salaries and suspension of many services were offset in some cities by constructive changes. The most important consideration was not the result of the depression in changing an individual program but rather the effect of the changes upon public thinking and upon official attitudes toward the health program. Experience showed that, with a poorly informed public, return of confidence and support was halting when the cuts were drastic and services were ruthlessly eliminated.

"Let us remember that progress toward the objectives of modern public health depends on the understanding and wishes of the people," he concluded.

Mass Testing Program Dropped by Georgia

The budget emergency in Georgia, representing an overall cut of \$678,000, has been met by changes in program and attitude and by the basic application of economy, announced T. F. Sellers, M.D., director of the Georgia Department of Health.

Of course, this emergency precipitated some inevitable changes, he added, but the State health department's greatest loss has been in its ability to expand in badly needed areas of health service.

Since Georgia's public health program is based on the local health department, the program reductions were made so as to cause the least possible damage to this basic unit, but this made the decisions even more difficult, Sellers stated.

Enumerating the economies, Sellers said that at the State level, categorical cuts were met by changes in categorical programs. Basic health services were scrutinized to determine where the cost could be reduced with the least damage to their operation. Purchasing policy was tightened; frills were eliminated. A more restrictive travel policy was adopted to limit the optional type of travel, particularly out of the State. Laboratory costs were arbitrarily reduced by 10 percent. Through normal attrition and transfer where possible, the number of employees was reduced, although in a few instances, the reduction-in-force procedure was necessary. The health department fortunately possessed an adequate cash working reserve, he said, enabling it to extend the "trimming down procedure" over many months.

Still, something big had to go to absorb the loss of \$678,000, and it was decided that dropping the mass testing program would least affect basic health services, Sellers stated. Extremely popular, and one of the earliest screening programs, Georgia's mass testing had done perhaps as much good in health education as in case finding, he said. Recently, however, he pointed out, the number of positive bloods found in testing for venereal disease had been falling steadily. Such testing had become an expensive enterprise with the close of the rapid treatment center at Alto, Ga., in October 1952.

Study was begun to establish a venereal disease program within the funds available on the basis of com-

municable disease investigator case finding and local treatment, simplified by the development of Bicillin, Sellers said. The health department will continue a modified case-finding program for tuberculosis, using the mobile units formerly used in the screening program. Other testing was either discontinued or greatly reduced.

"If we will use our time wisely, if we will lay now the groundwork in planning for a new growth of sound program, we may in the long run recoup our losses," Sellers concluded.

Florida Health Programs Weather Budget Losses

Florida's State public health work is suffering severely as a result of budget reductions, according to Wilson T. Sowder, M.D., State health officer, Florida State Board of Health.

The basic programs of tuberculosis control, venereal disease control, laboratory services, sanitary engineering, and vital statistics were especially affected in 1953-54, he said. Other State programs suffering from severe cuts during that fiscal year were diabetes, cancer, maternal and child health, dental health, field training, and accredited training. In 1954-55, still further cuts are planned in the major basic programs.

Some reductions have been somewhat offset, however, by legislative increases in funds for special purposes and in increased local appropriations that have, however, been unevenly distributed among the counties in the State, he said.

"Naturally, a part of the difficulty has been due to the necessity of serving a greater population," he said, pointing out that Florida's population is increasing at the rate of about 5 percent a year, or about 600,000 people over a 4-year period. Therefore, when appropriations are not increased, public health suffers accordingly, he stated.

"The brighter side of the picture is represented by the increase in State and local funds for county health departments and in State funds for mental health, nursing home inspection, and mosquito control," Sowder remarked.

Home Accident Survey Launches State Project

In Kentucky, a survey of Harrison County marked the first installment on home accident facts and figures to be collected for the home accident prevention program organized in the Kentucky State Department of Health in 1953.

This first survey reached nearly every home in the county, population 14,000, Barbara J. Smith, B.S., consultant nurse of the home accident prevention section, Kentucky State Department of Health, reported.

The new section has been set up in the State health department under the division of preventive medicine. The staff consists of a supervisor, 2 public health nurse consultants, 1 health educator, 1 sanitarian, and 2 clerks.

Smith named as the two objectives of the project the demonstration of the effectiveness of a statewide education program in preventing death and injury from accidents in the home and the integration of the specialized project with the State public health program.

New Field for Facts

"In Kentucky," she said, "we found the same problem which seems to exist everywhere—there are few or no figures on nonfatal home accidents. We don't know what kind of accidents cause the most injuries or how effective an education program might be."

The plans, she indicated, are to survey 1 experimental and 1 control county in each of the 3 geographic areas of the State, the east, central,

and west. Each home in the 3 experimental counties is to be visited to collect data. An extensive education program will follow the surveys. Another survey within 1 or 2 years is planned to measure the effects of the education program. The 3 control counties are earmarked for a survey of a random sample, with no educational followup. The same sample will be resurveyed within a year or two.

Harrison County was the first experimental area surveyed. It is a typical county in the Bluegrass region, Smith said. In addition, the Harrison County Health Department, staffed full time, requested the project, and the community adopted it as their own, she emphasized.

Survey Organization

The step-by-step organization of the survey, related by Smith, was in brief:

Community leaders and officials and representatives of social and civic clubs, comprising a membership of more than 1,000 women, were consulted to ascertain their acceptance of the project. It was cleared through the county medical society and the county board of health and

approved by the county judge and the city council of Cynthiana, Ky.

An active community leader, Mrs. G. L. Tucker, was appointed general chairman of the survey. She prepared a calendar of the meeting dates of every organization in the county and in Cynthiana. Then she got in touch with the presidents and asked them to invite a member of the State staff to appear before each group to explain the survey and to recruit volunteers.

Talks were given before 33 different civic, social, and education organizations, such as Homemakers, PTA, Lions Club, Rotary Club, Farm Bureau, County Club, Woman's Club, and Junior Woman's Club. Staff members were accompanied at each of the meetings by a county health nurse or the county sanitarian and the home demonstration agent or the general chairman.

Every group voted to support the project and each one appointed a health chairman to meet and work with the staff on plans.

The questionnaire, worked out by the State health department staff in consultation with the Public Health Service, the State field advisory nurse, the State field sanitarian, and

New Home Accident Prevention Programs

Accidents, now in fourth place as a leading cause of death for all ages and the leader in the age group 1-35 years, are beginning to receive the public health department emphasis once placed on the communicable diseases. Approximately one-third—29,000 in 1953—of all accidental deaths occur in the home and the injuries can only be estimated.

In line with this new emphasis, the W. K. Kellogg Foundation, in the fall of 1953, gave grants to eight State health departments to demonstrate the State health department's place in the prevention of home accidents. Previously the foundation limited its support to local health department projects. The eight States are California, Georgia, Maryland, Massachusetts, North Carolina, Kentucky, Kansas, and Oregon. Each of the eight States receiving grants is free to proceed toward the prevention of accidents as it thinks best. The first chapter in Kentucky's program is reported here.

the State field health educator, was pretested with health chairmen of the cooperating groups at a meeting called by the general chairman. Last minute changes were made in accordance with their suggestions.

Questions on tuberculosis and sanitation had been added to those on accidents at the request of the county health department. The additional questions, the local health department felt, would take only a few minutes more in survey time and would supply data on the county's two main health problems.

The county health department and the State home accident prevention section conducted training sessions for small groups of volunteers, who were assigned to cover their own neighborhoods. Part of the session was a mock interview, with one of the workers in the group answering the questions about an accident that had happened in her home.

Each worker was given a six-item packet. The first two items were the requisite number of questionnaires and a form on which to fill in the street or road surveyed, the number of houses visited, the number of families refusing to answer questions, and the number of families not at home. The questionnaires and forms were returned to the county health department.

The remaining four items to be left at each home, consisted of a sheet that explained the purpose of the survey, one listing the health services available from the Harrison County Health Department, a sheet announcing the time the tuberculosis mobile X-ray unit would be in the county, and a home safety check list pamphlet.

The survey was well publicized by the two weekly newspapers, posters placed in the stores, and fliers given every school child to take home.

Survey Findings

With the aid of 306 volunteers, the survey began February 15, 1954, and was completed the following week, Smith reported. Ninety-six percent of the estimated 4,000 households in

the county were visited, she said, and only 10 families refused to answer questions.

Although the results have not been completely evaluated, Smith reported the following high points: The total number of accidents recorded was 987. Farm accidents were not asked for, but 110 were reported. Falls were the most frequent kind of accident in all age groups and accounted for more than one-half the total number of accidents. Carelessness, accounting for 34 percent of all accidents, was reported as the leading cause of accidents. The largest number of accidents happened in the yard. Cuts were the most frequent type of injury. Almost one-half of the accidents reported required the care of a physician, and the injury lasted more than 1 week. Three persons suffered permanent injuries.

A health council, composed of the same health chairmen and the general chairman who helped in the survey, has now been formed to plan ways to reduce home accidents in Harrison County, Smith said.

The survey produced two major benefits, she declared. It provided the information needed to launch a State education program, and, in the process, the people in the county became conscious of home accidents.

Basic Education Methods Apply to Home Safety

Speaking on education methods in home safety, Marguerite Green, M.P.H., health educator with the home accident prevention section of the Kentucky State Health Department, said the same basic principles of educational psychology and sociology apply as in other health programs. Only the content is changed.

Basic, she said, is program planning—determining the broad goals and the immediate objectives needed to accomplish them. Clearly defined goals, set down in writing, lead to

definite action and make evaluation possible, she emphasized.

Green illustrated her discussion of methods with examples of planning, community organization, and information applied in the Kentucky accident prevention program.

The ultimate goals of the program, she pointed out, are to reduce death and injury resulting from home accidents and to integrate the program into the existing health programs.

The short-term goals are (a) to study the problem of home accidents in a sample of the population as representative of the State as possible, with the people in the local communities taking part; and (b) to set up in each area studied a program aimed at the prevention of home accidents.

The broad planning, she said, needs to be done by the staff with all staff members taking part to whet their interest in the accomplishment. The more detailed planning must be done with the people for whom the program is intended, Green explained.

Planning is a continuing process, she said. In Kentucky, after Harrison County had been selected as the first county for study, the survey plans were made with the people of the community and the local health department staff.

Community-Centered Program

Following the criteria which has accompanied the success of other community-centered programs, Green said that Harrison County was selected because the local health department personnel asked for the program, and the community leaders agreed that the program would be a good one for the county. Community leadership was already well developed and the people had worked together on other projects. They seemed ready for an experience that would involve the whole county in a joint project, she said.

Since it is important that community leaders and program administrators agree on the purpose of a

program, a great deal of attention was given to the explanation of the broad objectives of the program as well as the immediate objectives of the survey in talks to the organized groups of the county, Green reported.

The community leaders and groups also approved the methods proposed for solving the problem—a questionnaire study in which the people in the county could participate.

In stressing the importance of a well-developed information program in health education, Green suggested that this yardstick be applied in producing information materials: Will the people find in the information something to satisfy their wants or to help them in achieving their goals?

"Let us suppose," she said, "that after studying the home accident problem in a particular community, the people decide that falls down stairways are a problem on which action should be taken. In that setting, a pamphlet discussing the ways in which falls down stairways may be prevented becomes very meaningful."

Advocates Pretesting

The pamphlet selected by the staff for the survey program was not entirely appropriate for the environment in which it was to be used, Green commented. It had been prepared with small regard for the simplicity of the rural home and way of life, she said. The beautiful winding staircase with the roller skate on one step had little meaning to persons in an environment where roller skating is an impossibility.

Pretesting materials with some of the persons for whom they are intended prevents this type of error, Green pointed out. Today, she said, we are thinking of pretesting educational materials while they are in the preparation process.

Before making the final draft of the questionnaire prepared for getting information about home accidents, the State staff asked repre-

sentatives from community groups to review the questions with them from these standpoints: Is the meaning of each question clear? Will it be possible to answer the questions with short meaningful answers? Are you willing to ask the questions of your neighbors? Would you object if your neighbors asked these questions of you?

The county group suggested that a flier be prepared explaining the purpose of the survey, that the services of the county health department be listed on another flier, and that a pamphlet on home accidents be included in the material to be left in the homes, she reported.

Terming "word of mouth" a powerful force in any information program, Green pointed out that this method is stressed in the Kentucky home accident prevention program. At least 80 percent of the householders in Harrison County talked about home accidents during the survey, she said.

Safety Promotion Is Part Of Nurse's Daily Work

Down through the years, the public health nurse has promoted safety in every duty of her daily work, Madelyn H. Davis, B.S., nurse consultant of the home safety unit, Georgia Department of Public Health, declared.

As an example, she said, the nurse who urges a mother to hold her infant while giving him a bottle is teaching the mother three things: to relax and get much needed rest during this time; the importance of giving the infant the fondling he needs to foster a feeling of security; and to avoid the danger of the infant's strangling on aspirated milk.

"But have we done enough?" she asked, indicating that the answer was: "Obviously not, since the number of deaths due to home accidents has remained about the same year after year, while many of the disease killers have declined."

Nurse the Key Worker

Home accidents constitute a sizable health problem, she stated, and should be given a proper place in the program planning of all public health organizations, with all members contributing. But the key person in a home accident prevention program is the public health nurse, she indicated, since no other public health worker has as many contacts with families or goes as often or as regularly into homes.

Davis recommended some intensive "home work" for nurses as a preliminary to teaching home safety. First, the public health nurse must get the facts about fatal and nonfatal accidents in her own county or community so that she can concentrate her efforts where they will do the most good in her busy day, Davis said. She advised nurses to find out what types of accidents occur most frequently, the age group most affected, and the human and environmental factors that predispose persons to accidents.

What To Do

Davis outlined specific safety activities a nurse might incorporate into her existing work pattern in home, clinic, and school visits, and in group teaching and community activities.

On home visits for whatever purpose, she suggested:

1. Observe each environment for deficiencies or conditions that are potentially hazardous. Consider the ages of the occupants and remember hazards are not the same for all ages: (a) Record findings on family folder; (b) make recommendations for corrections; (c) report to the proper authority unsafe conditions that cannot be corrected by tenants; (d) follow up on corrections during next visit; (e) seek help from engineer or sanitarian when needed.

2. Help the housewife recognize and make allowances for the human factors that may cause accidents such as youth or age and the effect of disabilities. Assist the family to

develop a positive philosophy. Accidents need not "just happen."

3. In prenatal care emphasize safety in cooking to avoid burns and cuts; safe clothing to avoid falls and fatigue; safe bathing; care in lifting, reaching, and climbing stairs.

4. In infant and preschool care emphasize complete protection of infants and education geared to a child's growth and development pattern, such as satisfying the child's normal curiosity and knowing what he is physically capable of doing.

In schools, Davis said, home safety education can be correlated with the existing school safety program. Fire prevention, patrol, and driver education are all integral parts—why not home safety? she asked.

In group teaching, safety education can be included in each area of a class, Davis observed. She gave as an example a mother and baby class. When discussing equipment needed for infant care, she said the nurse can stress the importance of a non-tilt high chair; lead-free paint on the baby's bed; toys with no removable parts; and the danger of bottleholders.

Safer Car Parts Sought In Accident Study

Automotive crash injuries are under study in North Carolina, Maryland, and Virginia to determine what parts of the automobile cause the most injuries.

Charles R. Council, A.B., chief of the public health statistics section of the North Carolina State Board of Health, reported on the progress of the North Carolina study begun in September 1953 as a cooperative project of the Cornell University Medical College, the North Carolina Department of Motor Vehicles, and the State board of health.

The objective of the study, according to Council, is to produce factual data for the use of automobile manufacturers and engineers in redesign-

ing cars to reduce personal injuries and deaths.

The National Safety Council estimates the national cost of passenger car injuries at more than \$1 billion annually for medical care, insurance claims, and loss of services to the Nation, he said. Motor vehicle accidents have been 1 of the 10 leading causes of death for more than 30 years and now rank as the sixth leading cause.

Six rural areas, representing all types of terrain and highway passenger traffic in North Carolina, were selected for the 12-month study—a 2-month survey of each area, Council related. The areas include 17 counties and range in size from 1 to 5 counties. Military camps are located in 2 of the areas. The study of 2 other areas was timed to coincide with the peak of the tourist travel, he said, and the remaining 2 areas had little seasonal change in the number of accidents.

Data Collection Process

Council's account of the study procedures follows:

The State board of health, through the local health departments in the areas studied, supervised the medical aspects of the study. The State motor vehicle department, through its highway safety division and its patrolmen, obtained the facts at the scene of the accident. And the Cornell University Medical College is analyzing the data collected and will publish the findings.

A physician on the State board of health was assigned the job of co-ordinating the activities of the medical college, the health and medical organizations, and the highway personnel.

Before an area was studied, the State coordinator conferred with the health officer of the area in order to familiarize him with his responsibilities as local medical coordinator of the program. Meetings were held with each medical society, the hospitals concerned, and military personnel in the area. Each physician in the area was sent a letter

explaining the project and requesting his cooperation. The project was publicized by the newspapers, radio, and television.

Simultaneously, a 2-day formal training period was conducted by Cornell representatives for all members of the highway patrol group. They were given detailed instructions on the preparation of the forms and on the types of accident photographs needed. The patrolmen were instructed in the proper use of the press-type cameras purchased.

The two key persons in the sample area were the local health officer and the highway patrol sergeant. The local health officer was notified immediately after each accident of the time, location, number of persons injured or killed, and where the accident victims were taken for medical care. The health officer then obtained completed medical reports from the hospital or physician for every victim. Completed reports on all accident victims were mailed to the State board of health.

At the district highway patrol headquarters, the sergeant commanding the patrol group collected the completed accident report and matching photographs of each damaged automobile and sent them to the State board of health. There they were matched with the medical reports and forwarded to Cornell for coding, tabulation, and analysis.

Preliminary Data

During the first 8 months of the survey, Council related, reports were received on 161 automobile accidents; 237 occupants were injured or killed. Preliminary data for the first 50 accidents, he said, indicated that 64 percent of the accidents occurred to cars traveling less than 40 miles per hour. Slightly more than one-half, 52 percent, of the accidents resulted from head-on collisions; one-fourth were from rollovers. Approximately 38 percent of the victims received head injuries, and another 25 percent were injured in the lower extremities.

Safety experts visualize as possible features for the cars of tomorrow pop-out windshields, dashboards cushioned with leather or a malleable metal designed to give with impact, wrap-around glass that will not shatter, recessed knobs and handles, safety locks on doors, safety belts, and similar protective features, if the study finds such safeguards feasible.

Statistical Comparisons Can Evaluate Services

Most local health department services can be evaluated quantitatively through statistical comparisons using information at hand or readily available, according to Katheren M. Clay, M.S., director, division of statistical services, Kentucky State Department of Health.

Clay gave examples of comparisons which can be made in several fields—sanitation, communicable disease control, and maternal and child health—to determine how completely the services are covering the group to which they are directed.

In a sanitation program, she noted, the roster of establishments subject to inspection provides a "built-in" standard for measuring accomplishment. At any time during the year, the number of establishments inspected can be compared with the number registered to see whether the goal of 100 percent inspection has been reached, she explained. If not, either progress or regression will be shown by the variation in percentage inspected from one period to another.

As an example of how data outside the program itself may be used as a basis for evaluation, Clay suggested that reported deaths from notifiable diseases be matched with reported cases. Each death unmatched with a case report should be investigated to determine why the case report was not made so that measures can be taken to prevent

similar failures in the future, she stated.

Death-case matching in Kentucky, Clay specified, indicates that in 1952 more than one-fourth of the infectious hepatitis cases, nearly one-fifth of the whooping cough cases, and one-tenth of the diphtheria cases were unknown to public health officials, despite the fact that statutory law requires these diseases to be reported. That 100 percent reporting can be achieved is shown by the complete matching of cases for the 129 poliomyelitis deaths recorded in 1952, she stated.

Maternal and Child Health

Natality data afford a useful comparison base in evaluating some phases of a maternal and child health program, Clay said. The annual number of live births closely approximates the number of mothers who may receive maternity services from the local health department. In this case, it is preferable to use resident birth statistics published by the State, since these take into account births to residents which have occurred elsewhere, she noted.

The number of admissions to prenatal and postpartum services can be compared with the number of resident births to determine the approximate percentage of mothers receiving such services, she explained. Imbalance in either service can reveal a weakness in coverage. The number of admissions to infant services also may be compared with the number of births, she stated, although the number of births is not a precise measure of the number of children eligible for such service.

Clay presented a chart showing percentages of admissions to selected maternal and child health services in Kentucky local health departments in 1953 and pointed out the variations from county to county and from service to service.

All of the comparisons suggested, she noted in conclusion, are concerned with volume of services. Quality, however, must also be kept in mind, she said, but whether it is

better for the one nurse to serve half as many mothers and pay each twice as many visits is a question which only the administrator thoroughly acquainted with his own community can answer.

Fetal Death Registration Said To Be Improving

Reporting on Mississippi's experience in fetal death registration under the new definition, Z. E. Oswalt, field representative of the Mississippi State Board of Health bureau of vital statistics, said that the problems differ little from those encountered in the early years of birth and death reporting.

Registration under the new definition began in January 1952 when a new regulation went into effect in Mississippi, he stated, and the limited experience since that date does not allow assessment of all the problems of fetal death registration. The regulation defined fetal death as ". . . death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy . . .".

Registration Certificate

One of the first problems was the lack of a uniform practice and a uniform certificate for fetal death registration. The new reporting started, but the old stillbirth form was used, he explained. The old form was designed for reporting the deaths of fetuses developed beyond 20 weeks and asked only for morbid conditions causing death.

In 1953, a certificate representing more closely the thinking of all State registrars was put into use. This certificate, he said, is almost a duplicate of the regular death certificate and should provide the information needed in studies on the causes of fetal losses. We do not yet have a certificate that is generally approved by all the States, he noted.

Oswalt mentioned "resistance to

change" as another serious problem to be met before accurate fetal death registration will be possible. Habit, lack of the necessary information relating to the change, and failure to grasp the significance of the change and its ultimate effect in the prevention of fetal waste account for this resistance, he said.

About 25 percent of the certificates filed for fetal death registration did not show weeks of gestation and a considerable number of the certificates were filed with ill-defined or unstated causes of fetal death when the 1953 certificate was used, he reported.

Evidence of Improvement

Evidence of progress, however, can be found in comparing the number of fetal deaths registered since 1951, Oswalt stated. In 1951, 1,884 fetal deaths were registered; in 1952, the number was 2,518; in 1953, incomplete figures are 2,294, still higher than the number in 1951. To date, 403 fetal death certificates show gestation of under 20 weeks, deaths previously nonreportable, he noted.

A comparison of the first 3 months of 1952, 1953, and 1954 also show improvement, which, although not conclusive, indicates that the general trend is toward an increase in fetal death reporting, he said.

Another encouraging development, he pointed out, is that hospital staffs and medical record librarians have asked the bureau of vital statistics to meet with their groups to discuss fetal death registration and other phases of vital record reporting. Never before have our hospitals and physicians shown that much interest, Oswalt said.

Efficient Local Registrars Are Prime Requisite

Obtaining the right person to do the job is the prime requisite in improving registration of births, declared Sue Lackey, director of the vital statistics division, Memphis

Shelby County Health Department.

Since registration is primarily a local responsibility, the degree of success can invariably be measured by the effort and enthusiasm for the job manifested by local registration personnel, she explained. Decreasing the number of registration districts, which will permit the employment of more full-time registrars, was cited as one method of obtaining more efficient personnel.

Also essential are the right tools with which to do the job, that is, laws and regulations, Lackey noted. Not only must we have laws requiring registration of vital events, but we must have laws every citizen will respect as being aimed at the primary function of vital statistics, which is "to collect and preserve such documentary evidence concerning births and deaths as is necessary to protect the legal rights of individuals," she said.

To obtain the greatest possible number of complete, accurate, and prompt reports, Lackey suggested, registration personnel can compare their records with monthly reports of institutions and funeral directors, with public health nurses' family records for unreported births, with newspaper reports of births and deaths, and with county welfare department records. She also suggested that infant death certificates be matched to birth certificates and that nurses making prenatal visits give expectant mothers birth report card forms.

Problems of the South

According to a recent report on birth registration completeness by the National Office of Vital Statistics, Public Health Service, the southern States have the most serious registration problems of any area of the country, Lackey pointed out. This, of course, is not surprising, she said, since these States have the highest proportion of home deliveries.

Significant, however, is the fact that the greatest improvement the south has made, has been in regis-

tration of home deliveries, the vital statistics director declared. Mississippi now ranks third in the Nation in completeness of home birth registrations, she said.

Noting that Tennessee led the Nation in improvement in registration of births during the 1940's, Lackey mentioned some of Tennessee's promotional activities. Education programs, she reported, have been directed toward several groups: registration personnel; physicians, medical students, nurses, and midwives; public school students; and the public. Also important has been Tennessee's support of, and participation in, programs designed to coordinate vital records and to maintain consistency in national vital statistics, she stated.

A Definition of Evaluation For Public Health Work

Convinced that evaluation has a variety of meanings in its application to public health, B. G. Greenberg, Ph.D., professor of biostatistics, University of North Carolina School of Public Health, wonders whether the popularity of the term has led it to become a "fetishism" and a "password to facilitate admission into the society of scientific and research personnel."

He recommended that evaluation connote "followup of treatment," in the sense of treating the health needs of a community. An advantage of such limited definition is that evaluation and its methods can be discussed without a wide divergence of meaning, he said.

The Sequence of Steps

Greenberg illustrated the meaning of followup of treatment by an analogy showing the steps taken by a physician in private practice concerned with the health status of a single person and the steps taken by a public health worker dealing with the community at large. The com-

parative sequence of steps taken in each profession to reach similar goals follows:

Case history. Study of population and its demographic structure. Study of environmental, geographic, climatic, and other factors in the community.

Physical examination. Further detailed study of environmental influences by inspection methods. Sample surveys and censuses to measure prevalence of disease conditions, level of immunization, and others. Inventories of what is being done or performed in the community with regard to health and health problems.

Diagnostic procedures. Use of tools of community diagnosis commonly referred to as vital statistics and morbidity rates and ratios. Use of approved standards for comparative purposes.

Diagnosis. Diagnosis or diagnoses in terms of the health needs of a community.

Treatment. Certain social actions may be instituted for specific purposes, such as more clinics, specialized programs, or other public health measures.

Followup of treatment. Relationship of treatment to the elimination, correction, or remedial action indicated by the diagnosis. Relationship of accompanying beneficial or malignant side effects. Consideration of cost.

By relating the results of treatment to the ultimate objectives of public health, evaluation can determine whether a particular vaccine, program, service, or clinic promotes or produces the objectives for which it was initiated, Greenberg stated. It affords a means of expressing quantitatively an "effectiveness quotient."

If evaluation is considered in these terms, inquiry about the nature of objectives that are acceptable to health programs might then be made, he indicated. In practice, the ultimate objectives of a public health program are too distant to be of

much worth in the evaluation process. Consequently, there have been substituted a number of intermediate goals which are not endpoints in themselves but are based upon the postulate that morbidity and mortality will eventually be affected if a series or a chain of prior accomplishments is fulfilled. The reduction of morbidity and mortality is the long-range goal of public health, he stated.

Current Usage

Greenberg finds the definition for evaluation as given in Webster's New International Dictionary disappointing when in its omniactive concept the word is briefly defined as meaning "to ascertain the value or amount of; to appraise carefully."

Under this broad definition, measurement of the health needs of a community could properly be called evaluation, he said. And also, as is happening, it can mean an inventory of the amount of service provided by a program, a diagnostic tool, or, as he recommends, a measurement of the results of a program in terms of accomplishment of objectives.

He quoted Webster's definition of research to show how that definition more appropriately denotes what is usually meant by evaluation in public health. He said that the first five steps of his comparative sequence are more properly called research than evaluation.

The variety of meanings for evaluation may be noted in any scanning of current health articles, Greenberg commented. An examination of papers found in journals read by public health personnel, social workers, psychologists, sociologists, and economists revealed to him that a large proportion of articles contain the word evaluation whereas this was not true of papers published 20 years ago. The sudden fashion of the word may be attributed to a culture and economy which have put a premium upon efficiency of operation in administration, he suggested.

Vital Statistics Education Must Motivate Reporters

Committee participation, lectures, discussions, and field training are the techniques used by the Houston City Health Department to educate the initial reporters of vital statistics data, according to W. H. Alban, registrar and statistician of the department.

The need for good reporting of vital statistics has been demonstrated, but demonstration of need is not sufficient motivation for those who make the original reports, Alban asserted. Physicians, morticians, nurses, and midwives, he said, must feel that they are an integral part of the health department's vital statistics program so that their interest may be kept and enlivened.

Registrars must have the proper attitude toward, and relationship with, those who contribute the original data. Registrars' interest and enthusiasm for the use of data reported will help to stimulate the reporters' interest, he maintained. Pride, based on a feeling of responsibility and worthwhile effort, in reporting vital statistics must be instilled in the initial contributors.

Use of Educational Techniques

Although each of the educational techniques can be used for each group of reporters, some of them work better for certain groups than for others, he noted. For morticians and midwives, lectures and discussions have been the most practical educational techniques.

Third and fourth year students from Baylor University Medical School and student nurses participate in planned field training experience with the health department, he reported. Seeing the results of physician reporting and how the data are compiled and used is an excellent means of motivation. Lectures and discussions are also provided, but field training has been found more profitable to students.

Practicing physicians have a limited amount of free time and are difficult to reach. Some of them are reached, however, through the local medical society's maternal mortality and vital statistics committees, he said. Another way to reach practicing physicians is by fulfilling their frequent requests for special statistical analyses on births, deaths, and morbidity.

The hospital staff physician, usually an older man who has not had the benefit of orientation to vital statistics programs in medical school, is frequently difficult to work with, Alban commented, but after convincing one staff physician of the need for good reporting, we can depend on him to work with his colleagues.

Record librarians are another important group, he said. At present, the only channel through which they can be reached is their State and local meetings, but other approaches are being planned.

Although the registration education program is a good start, additional ways to educate the initial reporters of vital statistics data are always being sought, he concluded.

Georgia Project Provides Lesson in Statistics

The need for sound planning of the statistical phases of a program has been reemphasized by the experience in the tricounty school health project in Georgia, H. Bradley Wells, M.P.H., supervisor of the central statistical unit, Georgia Department of Public Health, concluded in his appraisal of the project.

Wells presented some of the findings for the first 3 years—1948-51—to illustrate the type of information obtained and to point out limitations of the data. More detailed tabulations were included in a preliminary report presented at the 1953 meeting of the American Public Health Association, he said.

The figures for the first 3 years, the statistician remarked, are based on only 60 percent of the records, and, therefore, considerable caution should be exercised in basing conclusions on them. He added, however, that many of the results probably will not be different in more complete tabulations.

Describing in detail the procedure whereby a 1:80 random sample of the project records was checked against abstracts of the data previously prepared, he concluded: "An adequately controlled abstracting procedure with definite classification plans can improve the quality of the abstracting in this project but cannot compensate for incompleteness and inaccuracies in the basic records.

Personnel of the statistical unit of the Georgia Department of Public Health assisted in the planning of records and the designing of forms and procedures for abstracting the data from the records and have been responsible for the mechanical processing of the statistical data from the project, Wells reported. A final statistical report is now in preparation.

Except for activity reports compiled during the project, the first statistical activity, abstracting of data for the first 3 years, was done after the third year of the project, Wells continued, and the next abstracting was done during the last half of the fifth year. Immediately upon completion, the abstracts were sent to the statistical unit of the State health department for transfer to punchcards.

On the basis of the experience in this project, Wells recommended that the following principles, which he recognized as not new, be applied to school health programs as well as to other programs:

1. Initial program plans should include plans for collection of data and for evaluation of results.

2. Collection of data should be limited to those necessary to meet the objectives and to evaluate the results.

3. Records should be designed to meet the needs of the program.

4. A uniform and systematic procedure for recording all data should be set forth.

5. Collection and analysis of data should be carried on concurrently with the operation of the program.

Project Objectives

The Georgia school health project, financed by the Children's Bureau of the United States Department of Health, Education, and Welfare, was set up to develop a program in a local health department for the correction of physical defects in public school children able to pay only in part or not at all for such correction, Wells noted in a brief review of background information. Physical examination in the school of all children in grade 1 and of selected children in grades 2 through 7, pediatric examination on a referral basis, and correction of defects were the steps in the operation of the program, he explained.

The following were listed by Wells as among the topics on which it was planned to collect data: (a) activity necessary to get children into school health examinations and pediatric examinations, (b) time lag between defect detection and correction, (c) proportion of corrections paid for by project funds, (d) correlation between diagnoses in the school and diagnoses in pediatric examinations, and (e) socioeconomic differences in prevalence of defects.

Cost Estimates

Discussing some of the difficulties encountered in preparing the statistical report for the first 3 years of the project, Wells pointed out that no provision for collecting data on costs for defect corrections had been made either in abstracting or on the punchcards. However, he said, two sources of cost data were available in the State health department office: accounting records, which included medical and hospital costs and a case number but no diagnostic code; and copies of the authoriza-

tions for payment for correction of defects, which showed diagnosis and authorized medical and hospital costs.

Briefly, the defect correction costs were estimated by taking a sample of defects reported and relating these to authorized costs, Wells stated. A total of 727 defects out of about 2,500 diagnosed in the pediatric clinic was included in the sample, and it was possible to match only 382 or 53 percent of these with the authorized costs. A better method of making the estimates, he added, would have been to go back to the case folder, which includes both diagnosis and cost data.

Despite the limitations, Wells concluded, the data do show variations in costs from one diagnostic group to another. For example, the average authorized costs for correction of a nose and throat defect were \$9 for hospital care and \$38 for medical care, whereas the average costs for general surgery were \$49 for hospital care and \$70 for medical care.

May Supply Punched Cards With Birth Certificates

Results obtained to date indicate that it is practical for States to submit punched cards along with copies of birth certificates to the National Office of Vital Statistics, according to Hazel V. Aune, chief of the National Consulting Service, National Office of Vital Statistics, Public Health Service.

The plan, 1 of 3 considered for eliminating duplication of effort in producing vital statistics, was first tried in 1951 and 1952 with Illinois as the cooperating State, she reported. Four States participated in the plan in 1953, and 7 additional areas (4 States, 2 cities, and 1 Territory), in 1954.

By early 1953, it was evident that the only serious differences between codes on the punched cards provided by the States and code assignments

made by NOVS for checking purposes arose because of the different coding systems used by the various States and NOVS, she stated. Mechanical conversion of State codes to NOVS codes did not always result in correct translation.

To meet this difficulty, a minimum core of common procedure was prepared by NOVS in consultation with State technicians and was distributed for review and comment in March 1954. On the basis of discussions, it appears that several States will adapt their processing techniques to conform with the proposed minimum core of uniform procedures for 1955 birth statistics, Aune reported.

Sees Growth in Prestige For Sanitary Engineering

Virtually unlimited possibilities for the advancement of sanitary engineering are foreseen by John E. Kiker, Jr., M.C.E., professor of civil engineering, University of Florida. "The future will be what we make it," he declared.

Kiker pointed out that within the past 20 years the sanitary engineering field has expanded tremendously. The sanitary engineer, he said, has been called upon to broaden his activities in order to keep pace with progress and new developments in environmental sanitation and public health.

Evolving from the basic fields of water supply, stream pollution, and waste treatment and disposal, he said, are such activities as industrial hygiene, insect and rodent control, atmospheric pollution, camp sanitation, noise reduction, food and restaurant sanitation, housing hygiene, sanitation of swimming pools and bathing beaches, milk pasteurization and control, shellfish sanitation, community planning and development, radiological health and civil defense, control of ragweed and other plants affecting human comfort and well-being, air conditioning, ventilation

and illumination, rural and institutional sanitation, and abatement of public nuisances.

In 1940, Kiker reported, the Massachusetts Institute of Technology Alumni Committee on Sanitary Engineering Education listed 40 occupations or job titles filled by sanitary engineers. The list would be larger today, and the kinds of jobs successfully filled by sanitary engineers will continue to grow, he said.

Kiker named as one handicap the fact that sanitary engineering has had no single professional home. The present position of sanitary engineers is not unique in the history of engineering professions, he reminded. They are now in the same position as that occupied by mechanical engineers before the American Society of Mechanical Engineers was formed in 1880, by electrical engineers before the American Institute of Electrical Engineers was started in 1884, and by chemical engineers before the American Institute of Chemical Engineers was created in 1908.

Propose Specialty Board

Citing the need for an effective professional organization which will encourage the study, elevate the standards, and advance the cause of sanitary engineering, Kiker reported on one encouraging development in this direction. The American Society of Civil Engineers is sponsoring a Joint Committee for the Advancement of Sanitary Engineering, which is exploring ways and means of forming such an organization without creating an entirely new society.

The committee has agreed upon nominations for a specialty board which will grant and issue certificates of special competence in sanitary engineering, he said, functioning in a manner similar to that of the American Board of Preventive Medicine and Public Health.

The board's "formation and successful operation should be a milestone in engineering history," Kiker declared. "It will represent the first

program in this country for specialty engineering certification beyond State registration requirements. Prerequisites for certification will include extensive experience of a responsible nature, written and oral examinations, State registration, and a degree in engineering or its educational equivalent."

The joint committee proposals may preclude the necessity of forming an organization separate from or competing with any of those now in existence, Kiker pointed out. Instead, he said, the developments are being supported by existing organizations. The joint committee now has representation from the American Water Works Association, the Federation of Sewage and Industrial Wastes Associations, the American Public Health Association, and the American Society for Engineering Education, as well as the American Society of Civil Engineers.

Achieving Recognition

In discussing other ways of achieving recognition of sanitary engineering as a separate and distinct branch of the engineering profession, Kiker offered various viewpoints on undergraduate and postgraduate preparation.

Some sanitary engineers and some educators are still recommending that undergraduate curriculums in sanitary engineering be abolished and that sanitary engineers be recruited from civil engineering graduates who return for graduate work, Kiker said. Principal reasons given are the relatively small number of sanitary engineers and the belief that sanitary engineering training would be too narrow and specialized.

Proper promotion could help correct the small number of sanitary engineering candidates, Kiker declared. "We have simply fallen down on the job of fostering sanitary engineering and sanitary engineering education," he said, "as attested by the fact that few college freshmen know there is such a profession."

On the second score, Kiker maintained that the very nature of sanitary engineering makes it one of the broadest of all engineering fields. Background courses, such as chemistry, bacteriology, and sanitary science, essential for sanitary engineers are not usually available in civil engineering curriculums, he pointed out. Given the fundamentals of engineering as well, "it should be easier for a sanitary engineer to undertake regular civil engineering work than for a straight civil engineer to undertake sanitary engineering work," he said.

Common Core Education

On the other hand, Kiker pointed out that many people feel that there is already too much specialization in undergraduate engineering curriculums and that there should be a 3-year common core for all engineers. He mentioned as another possibility—an even better one for the sanitary engineer—a minimum 5-year curriculum, which some universities already require in all branches of engineering.

"Considering the technological advances that have been made in the last half century and the accelerated rate at which future advancements may be expected, it will be manifestly impossible to continue to crowd into 4-year curriculums the additional courses that are necessary to keep abreast of these advances in any engineering field," Kiker said.

By analogy to prelaw, premedical, and predental programs, it has been suggested that the standards of all branches of engineering be raised by establishing a pre-engineering program leading to a degree that does not have an engineering connotation, Kiker reported. A curriculum leading to the degree of bachelor of technology would fulfill the pre-engineering requirements just as degrees of bachelor of arts and bachelor of science meet the requirements in other fields, he said. With such a degree, Kiker explained, it would be definitely understood that only those

persons who take advanced engineering work would be entitled to an "engineering designation."

Describes Viral Forms Of Animal Hepatitis

Hepatitis in animals is caused by 6 known and 1 presumed virus, said H. R. Seibold, D.V.M., member of the department of pathology and parasitology, School of Veterinary Medicine, Alabama Polytechnic Institute.

In classifying the disease according to the cause or etiology, he used the term "hepatitis" broadly to include "all of the reactions that liver tissue may experience as a result of injury." Thus, he discussed hepatitis caused by toxic substances—such as a vegetable poisoning (*Amanita phalloides*) affecting man or the evidence of toxic hepatitis in dogs caused by carbon tetrachloride and other poisons; hepatitis of undetermined cause—such as the newly discovered hepatitis X occurring in dogs in the southeastern United States; hepatitis occurring naturally and caused by nutritional deficiencies—more common in man than in animals and recognized only in the dog; and hepatitis caused by viruses.

Viral Hepatitis

Hepatitis of viral origin is well known in dogs and in people, to whom Seibold referred for the purpose of drawing comparisons between liver disease in animals and in people. No connection between the viruses causing these two forms of the disease is known, he said, emphasizing that reports that human hepatitis virus has been transmitted to animals require confirmation.

Infectious hepatitis, caused by virus A, and serum hepatitis, caused by virus B, are the two types of viral hepatitis found in people. Mainly, these are differentiated by epidemiological observations, said Seibold, because no satisfactory experi-

mental animal has so far been discovered. The growth of A and B viruses has been demonstrated in developing chick embryos or in cultures of various human and animal tissue, but there have been no diagnostic lesions, nor have there been any identifying tests available other than inoculation into man.

Yellow fever, a viral disease of monkeys and man, causing severe liver damage along with other important lesions, can be transmitted from monkeys to man and vice versa by several species of mosquitoes, Seibold also mentioned. Reactions to injury of the liver can occur as a local or partial manifestation of many infectious diseases, including bacterial, protozoan, mycotic, and parasitic diseases.

The Seven Forms

An abbreviation follows of Seibold's category of the seven forms of viral hepatitis observed among animals:

Infectious canine hepatitis or Rubarth's disease. Relatively common and important among dogs. Also found in foxes and wolves. Virus is not pathogenic for ordinary laboratory animals, but has been propagated in chick embryos. Disease can be confused with distemper, leptospirosis, and systemic toxoplasmosis in dogs, complicating clinical diagnosis. Jaundice is a relatively uncommon symptom. Histopathological examination is relatively accurate for diagnosis. Liver biopsy is a useful tool in diagnosing nonfatal cases.

Rift Valley fever. Virus pathogenic for sheep, goats, cattle, and man. Chief lesion of the disease in lambs is massive necrosis of the liver, resulting in up to 90-percent mortality. Mortality ranges from 10 to 20 percent in old ewes and is still lower in cattle. Disease has been reported among laboratory workers in England and America, but mortality in man is negligible.

Equine virus abortion with hepatitis. Mares apparently suffer little injury from infection, but presence

of multiple areas of focal necrosis in the liver is rather constant finding in the aborted fetus. Type A intranuclear inclusions are found in livers of aborted foals and in livers of newborn hamsters artificially infected. Possibility that agent may be pathogenic for man is suggested on the basis of experimental cultivation of the virus on human amnion which had been grafted to the chorioallantoic membrane of the developing chick embryo.

Hepatitis virus in horses. Similar to type B virus of serum hepatitis in man. Existence suggested in scientific literature. Hepatitis believed to have been caused by a virus existing in asymptomatic horses has been observed in South Africa, England, Norway, and the United States following injection of homologous serum in the horse.

Viral disease of ducks. Hepatitis-associated. Recently found on Long Island, N. Y. Characterized by high mortality and rapid death in young ducklings. Enlarged livers with hemorrhagic areas and swollen injected kidneys are found on autopsy. Virus has been cultivated in chick embryos and differentiated from Newcastle disease virus. No histologic description of liver changes were reported by researchers.

Avian hepatitis. More than 150 birds at the Philadelphia Zoological Gardens were killed in an epidemic reported in 1949 (involving 20 orders and approximately 40 families). It is not known whether the disease is related to viral hepatitis of ducks. Disease was transmitted experimentally to normal birds with filtered inoculum from diseased ones. Attempts were made to transmit human hepatitis virus to ducklings, pigeons, and starlings. In latter experiments, some inoculated birds evidenced liver disease within 2-3 weeks, but susceptibility of avian species to human types of hepatitis virus is still to be established.

Hepatitis virus in mice. Found by two English workers. Virus can be found in more than 50 percent of a certain mouse strain.

Training in Public Health Urged for Veterinarians

Special training in public health methods is as important for the veterinarian interested in a career in public health as veterinary medical training, maintained James H. Steele, D.V.M., M.P.H., and Robert D. Courter, D.V.M., chief and assistant chief, respectively, of the Veterinary Public Health Section, Epidemiology Branch, Communicable Disease Center, Public Health Service.

Pointing out that well-trained veterinarians who understand their responsibilities to the public health are essential to a successful veterinary public health program, Steele and Courter recommended that training in preventive medicine and public health begin in the professional school and continue in the graduate school of public health.

The graduate training of public health veterinarians should include two phases, they said: instruction in the general principles and practice of public health, including public health administration, biostatistics, public health economics, health education, and public health laws; and instruction in specialized fields, such as epidemiology, food hygiene, sanitary science, bacteriology, parasitology, immunology, virology, tropical medicine, medical entomology, and nutrition. Specialized curriculums in veterinary public health should emphasize animal diseases communicable to man and their epizootiology, the veterinarians specified.

Training in health education methodology, Steele and Courter considered of particular importance. In many instances, they stated, we have the scientific knowledge and experience to control animal diseases of public health significance. All that is necessary is to establish the desire for control in the minds of the public, and it is the public health veterinarian's responsibility to stimulate that desire through education.

Other functions listed by Steele and Counter as responsibilities of the public health veterinarian are: (a) investigation of diseases that may have an animal reservoir; (b) promotion of the control of animal diseases transmissible to man; (c) supervision of inspection and hygiene of foods of animal origin; (d) consultation and liaison with voluntary or official groups concerned with public health and animal health; (e) development of special statistical services for the zoonoses; and (f) research.

Twentieth Century Developments

Considering the history of veterinary preventive medicine and veterinary public health, Steele and Counter noted that these disciplines are 20th century developments based on 2,000 years of observations which were confirmed or modified through the science of bacteriology. They could not have developed on empirical knowledge based solely on observations, which were often subject to change, they stated. The growth of veterinary bacteriology provided the basis for scientific diagnosis and control of animal diseases.

They also pointed out that the importance of epidemiological methods in the control of animal diseases cannot be overemphasized. The available knowledge indicates that, although there is a certain constancy in the pattern of epidemics or epizootics, there are wide variations, interepizootic periods, and enzootic, epizootic, and panzootic characters as yet not, or only partially, understood, they said, adding that it is essential to take into account the history of the different diseases over long periods of time.

Mentioning some of the animal diseases of public health significance, in the Americas, Steele and Counter remarked that the World Health Organization has tabulated more than 80 such diseases and that, if rare ones are included, there are more than 100. The number of disease entities has grown rapidly in the past 20 years, they said, and

the knowledge of mammalian and avian reservoirs and arthropod vectors has broadened even more markedly, largely as a result of improved techniques for isolating and propagating micro-organisms and for detecting specific antibodies and the increasing availability of these services. The list of recognized diseases transmissible from animal to man will undoubtedly increase, they concluded.

Balanced, Varied Diets Are

Basis for Good Nutrition

Three cornerstones to good nutrition are balance, variety, and regularity in food habits, James M. Hundley, M.D., chief of the Laboratory of Biochemistry and Nutrition, National Institutes of Health, Public Health Service, declared in a summary of points to be emphasized in public health nutrition programs.

Hundley quoted what he considered a good definition of a balanced diet: "A diet varied in food intake at each meal, properly prepared, and consumed in such quantities as to obtain and maintain desirable weight." Since there are very few foods which are not lacking in one or more essentials for good health, each meal should contain foods of several types, he said. Certain foods consumed together each correct the deficiencies of the other.

Persons who say "I don't have to worry about what I eat—I take a vitamin pill every day and that makes up for anything I miss in my diet" are very wrong, according to Hundley. What they fail to realize is that vitamin pills cannot contain the complete assortment of the things we need in our diet. Vitamins are wasted unless proteins, carbohydrates, and fats are there to work with them in the maintenance and building of healthy body tissue, he said.

Hundley pointed out that most qualified nutritionists maintain that

not all of the vitamins and other dietary essentials which we require are yet known. Therefore, manufacturers usually put into vitamin pills only those substances which have been identified as being required by man, and those only.

Regularity, he reported, is important for two reasons. First, in order to obtain maximum utilization and efficiency from the food we eat, the body needs an even flow of a balanced mixture of the essential nutrients. Second, regularity is important because eating is primarily a matter of habit.

Obesity

Obesity is the most frequent major health defect in the American people today, Hundley maintained. "Obesity is a serious and dangerous health hazard that no person should tolerate any more than he would continue to ignore a malignant cancer," he said. "Those of us who are concerned with public health hear much about the importance of chronic diseases such as hypertension, kidney disease, coronary artery disease, hardening of the arteries, diabetes, and liver disease in our health programs. Present evidence indicates that if we could control obesity, we would do more in one stroke to control these important diseases than with any other single health measure."

Hundley feels that the importance of maintaining correct weight for height should be taught to children in the schools, along with other basic rules for good nutrition. Adults find it very difficult to change eating patterns which have been practiced for 30 or 40 years, he said. Children, on the other hand, are just beginning to form their food habits and are receptive to teaching.

Protein Intake and Dietary Fat

The body has only a very limited capacity to store protein and therefore needs a steady supply from the diet, Hundley stated. Two recent

studies suggest that protein inadequacy is responsible for much of the anemia which is found among our population, particularly in older age groups, he noted.

The average American diet consumed today supplies about 40 percent of the calories as fat, and there seems to be a steady trend upward, according to Hundley. The National Research Council recommends 20 to 25 percent. A substantial body of evidence is accumulating that dietary fat and the cholesterol which it carries are factors of primary importance in hardening of the arteries, which in its various forms results in much chronic disease. However, one should not go overboard and attempt to eliminate all fatty foods containing cholesterol, he said. To do so would wreck the adequacy of our present-day diets since it would require the elimination of whole milk, butter, cheese, eggs, and other foods which are basic and not easily replaced.

Enriched Products

One of the most important developments in nutrition during the past 15 years has been the growing practice of adding certain vitamins and minerals to bread, corn, other cereal products, milk, and margarine, Hundley explained. The consumption of enriched products has been a major factor in the virtual disappearance of the vitamin-deficiency diseases. Public health workers need to lend constant support to maintaining and extending the practice of enrichment, he declared.

In the opinion of nearly all nutrition experts, it has been shown conclusively that the consumption of iodized table salt will eliminate most, if not all, of our endemic goiter problem, Hundley continued. Unfortunately, only about 50 percent of our table salt is iodized, he said.

Nutrition Fads

Nutrition fads do real damage by undermining sound nutrition knowl-

edge. Hundley contended, quoting L. A. Maynard: "Food faddism and bad dietary practices thrive on half truths and speculations regarding nutritional questions which have not been adequately studied." The only real answer to food fads and quacks is sound nutrition education, Hundley said.

The nutrition expert's final word of advice was: "See your doctor." He pointed out that many people, because they have eaten 3 or 4 meals a day for 30, 40, or 50 years, feel they know what is best for them—and often for their friends and neighbors as well. Consequently, they are disinclined to seek professional help until they are in serious trouble.

Free Counseling on Food For Older Persons

A program of nutrition counseling was begun in St. Petersburg, Fla., in June 1952 for the purpose of explaining nutrition principles and how older people can apply them to everyday eating.

Marjorie M. Morrison, M.S., chief nutrition consultant of the Florida State Board of Health, in reporting the counseling program, stated: "We believe we are promoting better food habits and better management of the money people have to spend for food. We're trying to give them a real incentive to eat adequate meals so they will 'live alive as long as they live.'"

Preliminary Study

A preliminary study in St. Petersburg indicated problems of general concern to a great many older people. These, according to Morrison, were:

1. Economic limitations in food purchasing by some people on fixed income retirements.
2. Poor selection of food due to a lack of knowledge.
3. Limited cooking facilities and improper preparation of food.

4. Lack of motivation, since many live alone. Other emotional problems may enter in.

5. Food faddism and misinformation. This older age group seems to be particularly susceptible to the "health food" stores. They eagerly grasp at any straw that promises prolongation of life and health.

6. Fixed food habits. Two meals a day is common. When the first is made up of coffee and a sweet roll, the day's intake is likely to be inadequate.

7. Restricted diets for therapeutic purposes, given years ago for some condition which has never been reevaluated.

8. Food prejudices. A food disagreed once upon a time and is omitted forever. Some believe that orange juice is too acid.

9. Food fears. Some believe that white flour will kill one or that eating chickens fed hormones will cause cancer.

10. Possible retarded digestive process, such as lower gastric acidity.

11. Poor appetites.

12. Poor dental status.

Since it was obvious that an education program could solve many of these problems, three nutritionists of the Region IV Gerontological Committee of the Florida Conference of Social Work were asked to plan a program which would make available free, accurate information on foods and nutrition, Morrison reported.

The question of where to meet involved thought and effort. Morrison pointed out that it was necessary to have a comfortable, pleasant place, free of charge, near public transportation and on the ground floor or with an elevator. The home service director of the Florida Power Company offered the food demonstration room, which seats 90 people and has audiovisual equipment, she reported.

Four Series of Meetings

Morrison described the four series of meetings:

After publicity through radio and press, the first series of 10 meetings began in June 1952. These sessions, held twice weekly from 10 to 12 a. m., were conducted on an individual counseling basis; therefore, no specific topics were assigned to each session.

Soon it became apparent that the same questions arose over and over—many were of a medical nature. There was the usual interest in special diets, constipation, vitamin pills, and "health foods." Attendance varied from 3 to 18 people. Contributing factors to the small attendance were the hot weather, vacations, and lack of sustained publicity. Those who came (ages 65-86) were enthusiastic and requested another series in the fall.

In order to cut down medical questions, to eliminate so much repetition, and to keep a few individuals from monopolizing the meeting, the second series was planned with specific topics, movies, and educational literature. The topic of the day was described briefly, and the film was explained. Following the film showing, the main points were reviewed, and the meeting was opened for discussion. During this series, publicity was intensified and sustained. Average attendance was between 80 and 90 people. Many returned each week, so a friendly atmosphere prevailed.

The third series in the spring of 1953 consisted of eight cooking demonstrations by home economists of the Florida Power Company. Each demonstration was followed with an informal talk by one of the nutritionists on the nutritive value and the cost of the food prepared.

The fourth series, tactfully called Food for Folks After Forty, had, in addition to weekly talks by the nutritionists, informative discussions led by a psychologist, a physician, a rabbi, and an arts and crafts instructor.

Interest, as evidenced by attendance, continues, Morrison said. Because there are many "regular cus-

tomers," efforts are made to introduce variety. Many permanent residents are availing themselves of this service—not just winter visitors looking for some place to go, she concluded.

Change in Status With Age Called Incongruous

The automatic demotion in status which comes with age is the most basic of all the sociological problems of the aged in our time, declared John M. MacLachlan, Ph.D., head of the department of sociology and anthropology, University of Florida.

Considering such demotion increasingly incongruous and senseless, MacLachlan described the changes which a great proportion of those who retire or are forced into retirement must face: "Within a very brief space of time, the American citizen swings from responsible maturity to nonresponsible 'age.' In 2 or 3 years if he is fortunate, almost overnight if he is not, the American must alter his way of living to accept a role in keeping with a new status. He substitutes passivity for activity, dependence for independence. The high status that goes with experience is replaced by, at best, a patronizing respect. The sense of movement, change, accomplishment is replaced by one of stasis, monotony, idleness or meaningless activity."

MacLachlan suggested two ways to move in meeting the problem. One is to provide for the health and well-being of the aged, an area in which some gains have been made. The other is to work out a new and practical set of social values and attitudes regarding age and aging which will make a real place in the culture pattern for the older person, an area in which few if any gains have been made. It is the latter area which represents the great and

emerging sociological challenge of the aged, he said.

The sociologist noted some important differences between the status of the "old folks" of an earlier day and that of those of today. Being few in number, elders once were valued, he said; being unusual, they were interesting; and being the living ancestors of a compact kin group, they enjoyed an especial status as patriarchs or matriarchs. Today, age is not a rarity and is therefore not intriguing; with the increasing mobility of the population, the matriarch and the patriarch are no more, for there is no cluster of nearby kinsfolk.

Pensions Not Enough

Something to replace the dignity and stature which once were the rewards of long life is needed, MacLachlan maintained. He pointed out that pensions alone cannot suffice, for, difficult and cruel as it may be, the economic problem of the aged is only a portion of the picture, and the solution of this problem will leave equally important needs unmet.

Two factors which must be considered in dealing with the problems of the aged were brought out: Prolongation of life has been accomplished by postponing the advent of physiological decline; older persons do not suffer from the spiritual decrepitude that once came with resignation to the onslaughts of time.

The rest of our culture has not kept up with these changes, the sociologist stated, pointing out that we still insist that 60 or 65 or 70 years of age are milestones beyond which one cannot, must not, keep on being vital and productive.

But, more important than this, having abolished the traditional way of association between youth and age, we have replaced it with nothing, he declared. "We seek the cult of youth or early maturity in our social-institutional affairs to the detriment, too often the exclusion, of age; we put old folks 'in Coventry'

and avoid them. We do not do anything to help them fill the resulting social vacuum."

Adequate Medical Care Is Problem of Aged

The provision of adequate medical care to an ever-growing segment of the population whose income is relatively low and whose needs are relatively great is the most pressing medical problem related to the aged, in the opinion of Simon D. Doff, M.D., director of the division of heart disease, Florida State Board of Health.

Doff believes that both a cause and a cure for the problem may be found in the fact that only 25 percent of the 13 million persons over 65 years of age have some form of medical or hospital insurance, whereas 60 percent of the 145 million persons under 65 years have such insurance.

"The inclusion of more of the aged in the voluntary health movement has real possibilities as a solution for the individual and as a means of more effective utilization of community health services and facilities," Doff declared.

He pointed out that the average annual income of two-thirds of the persons over 65 years of age is less than \$1,000, not including the value of aid received from their families or of products raised for their own use by those living on farms. Sixty-two percent of the women and 92 percent of the men over 65 years are not members of the labor force, he said, and are therefore unable to join employee health insurance plans, although some of the women have insurance coverage as wives of insured workers.

As evidence of the greater need for hospital care among the aged than among the population as a whole, Doff cited these figures: In 1952, the average stay in general

hospitals for persons over 65 was an estimated 22 days; for all patients it was 10 days. If patients who died within 4 to 7 days after admission were excluded from the estimates, the difference would be even greater.

It is not known how much of the national civilian health costs the older population incurs each year, but, because there is more sickness among aged persons, the costs are much higher per individual among this group than among the population as a whole, he added.

Health Department's Role

More effective organization and utilization of existing health services and facilities can solve many of the medical problems relating to prolonged periods of convalescence at home or in an institution and to the frequent need for continued medical supervision, Doff maintained. He urged the local health officer to take the lead in organizing health services for the aged.

Quoting Dr. Frank M. Hall, Doff listed the following services that may be provided by the local health department:

"1. Teaching the hygiene of aging—consisting of diet, rest, recreation, and development of good personal health habits.

"2. Early finding, prevention, and stabilization of chronic diseases and impairments.

"3. Rehabilitation of, or aid in retaining, skills which will enable the older person to make the adjustments required because of the aging process.

"4. Education to break down the prejudices against older people on the part of employers and the community, or the imaginary prejudices existing in the mind of the older individual himself."

To these, he added a suggestion by Dr. Haven Emerson: "It may well be that a general home nursing service can be carried out by the public health nurses of the local health department, giving bedside care to

the sick, without loss of their major function, which is to carry out programs of prevention by education methods."

Basic Psychological Needs Of the Aged Must Be Met

Finding different ways to meet basic psychological needs is the principal mental problem of the aged. Problems such as illness, change of setting, and loss of loved ones occur throughout life and therefore present no new difficulties.

This was the conclusion of Paul W. Penningroth, Ph.D., director of the division of mental health, Florida State Board of Health. He further described the major problem as designing a program for the older person "in which security and safety continue to be his, in which there is a sense of being loved and wanted, and in which the feeling of being important and significant is present."

Love, security, and a sense of significance are frequently referred to as the three fundamental psychological needs, Penningroth pointed out. In childhood and early adulthood, a means of satisfying these needs can be found in the family situation or in the educational situation. As one grows older, however, family ties become fewer and loved ones are no longer present. Society, through the practice of retirement, emphasizes the younger person and largely ignores methods whereby the basic needs of the older person may be satisfied, although social security and pension plans are a step in the right direction, he said.

Emphasizing that the ability to cope with problems of old age is no different from the ability to cope with life's problems at younger ages, Penningroth listed the following problems of the older person: anticipation of, and attitudes toward, retirement; gradual loss, through death, of friends and relatives; so-

cial attitudes which expect older persons to "climb on a shelf"; facing a decline in physiological abilities; facing death; fearing the occurrence of "age" disease; facing insecurities, especially economic insecurity, with less confidence of ability to make a fresh start; adjusting to a slower pace; and a loss of a sense of importance.

"Confidence, ability to plan a rational attack, ability to maintain interest, a sense of security, a sound sense of self-sufficiency and independence—all these factors are necessary to cope with the mental problems of age," Penningroth maintained.

Changes in Mental Factors

Although "aging" cannot be said to begin at any specific age, Penningroth noted, one can expect as one grows older certain physiological and psychological changes to occur. He presented the following tentative conclusions, based on studies and research, about the kinds of changes in mental factors.

Intelligence. There is a gradual decrease in mental ability, more in speed of operation than in "power" of operation, more in mathematical and motor functioning than in verbal functioning. Differences between age groups, however, are less than variations among individuals of any given age.

Learning. The curve of learning follows other established curves of ability, with acceleration in youth and a gradual tapering off. However, no person appears to be too old to learn; interest and motivation appear to be primary factors, along with habit patterns and attitudes about ability to learn.

Memory. Loss of memory appears

to be more a factor of learning than a factor of age.

Interests. Interests decrease in variety. They shift from more active to more passive fields and from social to individual orientation. They focus more on stability and continuance of the accustomed and away from change and exploration.

Judgment and reasoning ability. These factors appear to reach their peak latest and are among the last to decline. Judgment in the older person is assumed to offset declines in physiological abilities and energy level.

scientific medical circles. The understandings which belong to such disciplines as sociology, psychology, anthropology, and even religious philosophy must be included in significant research concerning mental health, he declared.

Summary of Studies

Summarizing two studies concerning the effects of maternal deprivation on growth and development of the child reported by John Bowlby, M.D., in his monograph entitled "Maternal Care and Mental Health," Howell explained that were the evidence from either to be considered by itself, one could raise many questions concerning its validity. He noted, however, that many other studies have provided much the same results.

One of the studies which Howell summarized concerned a comparison of 61 children institutionalized for the first year of their lives with 113 children living with their mothers. The findings suggest only that serious interference with growth and development occurred in the institutionalized group and that this interference seemed to reflect itself pronouncedly after the fourth month of life, Howell said.

The professor of mental health also presented portions of a paper by Jenny Roudinesco entitled "Severe Maternal Deprivation and Personality Development in Early Childhood," which he said provides one of the best summaries of studies concerning maternal deprivation. The quoted portions deal with the phases through which a young child separated from the family, especially the mother, usually passes; the effects of short separations and of prolonged separations; and what can and cannot be done toward effecting recovery in children who have experienced prolonged separations.

Because the death rate for women is declining much faster than the rate for men, it is suggested that "something" other than a basic biological difference between the sexes accounts in part for the higher mortality among men. It is proposed that more attention be given to the study of male mortality.

Why Is the Sex Difference In Mortality Increasing?

By WILSON T. SOWDER, M.D., M.P.H.

IN 1662 Captain John Graunt, citizen of London, in a publication entitled "Natural and Political Observations" reported that more men than women are born and that more men die before their time. He noted, however, that "physicians say that they have 2 women patients to 1 man." These observations were made by a layman nearly 300 years ago; yet, public health workers even now give these matters little attention.

Today in Florida and in the United States about 106 white boys are born for each 100 white girls. The death rates in each age group are considerably higher among males than among females, but various surveys in recent years have shown that women are ill more often. Among the nonwhite population, too, more boys than girls are born and the death rate for males is higher than the rate for females, although the differences are not nearly as great as among the white race.

Dr. Sowder, a commissioned officer of the Public Health Service since 1934, is now on leave and has been serving as State health officer of Florida since 1945.

The life expectancy of a white girl at birth in Florida is 73.9 years, but a white boy at birth may expect to live only 66.7 years, a difference of 7.2 years. That this difference in life expectancy exists is well-known to all public health workers, but few have given much thought to the reasons for it. Many of those who have, apparently have concluded that there are basic biological differences between the sexes which bring about a higher mortality among men. This view is supported to some extent by the fact that nature arranges for the birth of a greater number of boys than girls.

It is conceded that women may be biologically somewhat more resistant to disease and death than men. Evidence is available, however, which suggests that men are in some way, consciously or unconsciously, adding to their native handicap in the struggle for existence and that, therefore, something can and ought to be done to reduce mortality among men.

Death Rates of the Sexes, 1920-50

In support of the premise that the higher mortality among men is due in part to something other than basic biological differences is the evidence provided by comparison of the

male and female death rates over a long period of time. Death rates for both sexes, of course, have been declining for many years. Significant is the fact that the rate for females has declined much more rapidly than the rate for males (table 1).

The age-adjusted death rate in Florida for white males decreased from 13.8 per 1,000 population in 1920 to 9.1 in 1950, a decrease of 34 percent. The rate for white females in Florida declined from 12.1 per 1,000 population in 1920 to 5.6 in 1950, a decrease of 54 percent. The most startling facts, however, are these:

1. In 1920, the death rate among white males in Florida was 14 percent higher than the rate for white females.

2. In 1930, the death rate among white males in Florida was 34 percent higher than the rate for white females.

3. In 1940, the death rate among white males in Florida was 53 percent higher than the rate for white females.

4. In 1950, the death rate among white males in Florida was 62 percent higher than the rate for white females.

The same trend is found among the white population in the United States as a whole, although the differences between the male and female rates are less; and also among the non-white population in Florida and in the United States as a whole, although again the differences between the rates are less.

Unless one is prepared to contend that the human race has changed biologically during these 30 years, it must be agreed that something other than a basic biological difference between the sexes accounts for the more rapid decline in the death rates for women than in the rates for men. It is hoped that more interest will be shown in finding this "something" and that it will be, at least partially, preventable or correctable.

Comparisons by Age Group

As shown in table 2, the percentage difference between male and female rates increased in every age group during the period 1920 to 1950, although the extent of the increase has varied from group to group. It will be noted that the largest percentage difference in the sex death

Table 1. Age-adjusted death rates, by race and sex for the United States and Florida, census years, 1920-50

Year	Age-adjusted death rates ¹ per 1,000 population				Percentage excess of male rate over female rate	
	White males	White females	Non-white males	Non-white females	White	Non-white
<i>United States</i>						
1920-----	14.2	13.1	20.4	20.0	8	-3
1930-----	12.8	10.6	21.0	19.2	21	9
1940-----	11.6	8.8	17.5	14.9	32	17
1950-----	9.7	6.5	13.5	10.9	49	24
<i>Florida</i>						
1920-----	13.8	12.1	19.5	18.8	14	4
1930-----	13.1	9.8	23.3	19.5	34	19
1940-----	11.5	7.5	20.1	15.8	53	27
1950-----	9.1	5.6	14.7	11.0	62	34

¹Total United States population of 1940 used as standard.

rates shifted from the group under 1 year of age in 1920 to the group 15-24 years of age in 1950. In 1920, the differences were relatively small for persons past their first birthday, the largest difference being 17 percent. However, in 1950, differences were as high as 114 percent, and for all ages from 15 to 74 years the rates were at least 50 percent higher for males than for females. A specific example of the change which has been taking place can be seen in the data for the 45-54 year age group: The rate for men was only 10 percent higher than the rate for women in 1920 and 78 percent higher in 1950.

Comparisons by Cause of Death

Although death rates for nearly every cause of death for both sexes have been declining steadily, there have been a few notable exceptions.

It is well known, of course, that deaths from lung cancer are on the increase, especially among men. In 1950, the death rates from respiratory cancer were 24.1 and 5.4 per 100,000 for white males and females, respectively, as

Table 2. Sex differences in death rates for the white population in the United States, 1920 and 1950

Age group (years)	Death rates per 1,000 population				Percentage excess of male rate over fe- male rate	
	1920		1950		1920	1950
	Males	Fem- ales	Males	Fem- ales		
Under 1	98.1	76.1	34.0	25.7	29	32
1-4	9.8	9.0	1.4	1.1	9	27
5-14	2.7	2.3	.7	.5	17	40
15-24	4.2	4.3	1.5	.7	-2	114
25-34	5.9	6.5	1.8	1.1	-9	64
35-44	7.7	7.3	3.8	2.4	5	58
45-54	12.0	10.9	9.8	5.5	10	78
55-64	24.2	21.7	23.0	12.9	12	78
65-74	54.2	49.9	48.6	32.4	9	50
75-84	122.5	116.4	105.3	84.8	5	24
85 and over	253.6	247.0	221.2	196.8	3	12

compared to rates of 4.8 and 2.1 in 1930. Here again rates for males are higher than those for females, and the difference is apparently increasing. If excessive smoking has contributed to this increase, as has been alleged, it will be interesting to follow the future trend of this disease to learn whether the increase in smoking among women will decrease the difference in mortality.

In considering sex differences in mortality, the trends in mortality from the cardiovascular-renal diseases and ulcer of the stomach or duodenum are particularly interesting. It is generally thought that emotional tension, overwork, and worry have something to do with the development of these diseases and with their management and cure. Added together, the many kinds of cardiovascular-renal disease cause more than half of all deaths in the United States today. Ulcer of the stomach or duodenum, although the cause of a much smaller percentage of deaths, is also a very common disease. As pointed out in a recent study by Kaufman and Woolsey (1), a similar disparity in trend between the sexes is found for these two causes of death.

In this study death rates of the two sexes were compared for the periods 1921-26 and 1942-47. Among women, the death rates for both causes of death declined remarkably, and the declines were greatest in the younger age groups. The cardiovascular-renal disease death rate for

women aged 25-34 years in the period 1942-47 was only 54 percent (down 46 percent) of the rate in the period 1921-26, and the declines were substantial but less in the older age groups. The death rate among women for ulcer of the stomach or duodenum was only 30 percent (down 70 percent) of its former rate in the age group 25-34 years, and again the declines were substantial but less in the older age groups.

Among men, however, the trend in mortality from these causes of death was radically different. Although the rates for cardiovascular-renal diseases declined slightly among men in the age groups 25-34 years and 75-84 years, mortality in all the intervening age groups increased. The greatest increase, 35 percent, was among men aged 45-54 years. Among women in the same age group, the death rate for the period 1942-47 had declined to 73 percent (down 27 percent) of its former rate. The male death rate for this age group for 1942-47 was twice the female rate. For ulcer of the stomach or duodenum, the trend among men was about the same, except that increased mortality began at age 45 years and persisted into all the older age groups. That the trend in mortality from this cause has not changed is demonstrated by the fact that in 1950 the death rate was four times as high as the rate for women for all age groups.

In 1950, the death rates in the United States for nearly all of the 64 major causes of death were substantially higher among men than among women (2). Female mortality was significantly higher for only 3 of the major causes: diabetes (62 percent higher among women), cancer of the breast, and cancer of the genital organs. It is not surprising, perhaps, that the death rates from suicide and homicide were about three times as great among men as among women, that accidental deaths were more than twice as frequent, or that the death rate from syphilis was twice as high. It may be surprising to many people, however, that the tuberculosis death rate was more than twice as high among men as among women and that men died 50 percent more often from poliomyelitis and 20 percent more often from pneumonia and influenza.

The cancer death rate was 5 percent higher for white males than for white females. Cancer

of the buccal cavity and pharynx and of the respiratory system killed four times as many men as women.

It is interesting to note that the two types of cancer which cause more deaths among women than men, cancer of the breast and of the genital organs, are relatively more easy to detect and to cure than most other types of cancers. The only other major cause of death which seems to affect women more than men, diabetes, is also relatively easy to detect and manage, and, even if it cannot be cured, it need not cause early death.

Speculations and Suggestions

Additional figures could be cited, but it is believed that enough have been given to establish that the death rate for women is declining much faster than the rate for men. Figures have also been given to show that male mortality is higher for most of the major causes of death. It has been suggested that the native frailty and fragility of the male cannot be the sole cause for the higher mortality, and the hope that study and research will be made to find other causes has been expressed. At present, it is possible only to point out a few factors which may have some bearing on the problem.

The man of today certainly has some handicaps which cannot be easily cast aside. In general, he is still the main breadwinner of the family and, therefore, is inevitably exposed to the worries and pressures of modern life, as well as to its physical dangers, to a greater degree than women. However, it does seem peculiar that the trend in mortality favors women at a time when more and more women have become employed and in occupations once monopolized by men. It may be difficult to show, therefore, that occupations account, in any large measure, for the higher mortality among men, although an occupational relationship should be investigated. A study of the Registrar General of England and Wales (3) pointed out that the rise in the mortality of men in going down the socioeconomic scale is largely a product of environment, rather than of occupation. This conclusion was based on the finding that the mortality of the wives of men in the various socioeconomic classes showed the same rise in

mortality in proceeding down the socioeconomic scale as did the mortality of the men.

It may well be that a difference in the reactions of men and women to modern life, including work, has more bearing than the work itself. Men are considered more dynamic than women, and nature may have intended that their energy should be dissipated largely by physical exercise. Today, physical exercise is not the necessary part of life it once was; moreover, it is assiduously avoided by some. It is possible that women escape the consequences of worry, frustration, disappointment, and tension to a greater degree than men by being more vocal about these conditions, through tears or occasionally hysterics. The reaction of men, on the other hand, may be in the form of coronary disease, hypertension, or ulcers.

Men are naturally more aggressive and venturesome than women. Their aggressiveness and lack of caution might explain their higher venereal disease rate, greater addiction to alcohol, and greater tendency to homicide and accidents. It is possible that males get around more and therefore suffer greater exposure to tuberculosis, poliomyelitis, pneumonia, and influenza. However, it is not established whether males contract infections and communicable diseases more frequently or whether they are simply less resistant to them and recover less often.

It may be that women are better and more frequent customers of modern medical science than are men. Sickness surveys have shown that women are ill more often than men (4). Women possibly have a greater tendency to stay away from work for mild illnesses than men, to go to bed sooner and stay longer, to go to see their physician earlier and return more often, and to follow their physician's instructions more faithfully.

Certainly, there are many more specialists in diseases of women than in diseases of men. It is also true that Federal and State governments have had special health programs for women for over a quarter of a century, but they have had none aimed specifically at improving the health of men. The health programs for women, of course, have been aimed primarily at preventing illness and death incident to the complications of childbirth, and there has been

a progressive decline in deaths from such complications.

The facts raise the suspicion that men are suffering from the very ancient delusion that they are the stronger and superior sex, when, as a matter of fact, we can only be sure that their skeletal muscles are stronger. In past ages a big biceps counted a great deal in the battle for survival, but it means little now. An inventory should be taken of the physical, mental, and emotional assets and liabilities of the male, and the knowledge used to halt the trend that has been shown.

It is not suggested that less attention be paid to the health of women, for much remains to be done for them. The time has come, however, to do more about the health of men, particularly middle-aged and older men. The male population should be aroused to take advantage of all

that modern medical and public health sciences have to offer. The medical and public health professions should be made more alert to the greater hazards faced by men.

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Medical Research Fellowships

Research experience for individuals interested in investigative careers is being offered to applicants for 1955-56 postdoctoral fellowships in the following programs administered for their sponsors by the National Research Council's Division of Medical Sciences:

Study in all branches of the biological, chemical, and physical sciences and of clinical investigation applicable to the study of typical or malignant cancer growth. Also, British-American exchange fellowships for advanced study in Great Britain on special problems pertaining to cancer growth. The awards are made by the American Cancer Society.

Research in the basic medical sciences—supported by the Rockefeller Foundation and by the Lilly Research Laboratories.

Investigation in fields related to tuberculosis—sponsored by the National Tuberculosis Association.

Preparation for research in the diagnostic aspects of radiology—supported by the James Picker Foundation.

Fellowship awards are offered only to citizens of the United States under 35 except that: Only citizens who are graduates of American schools may apply for the tuberculosis awards. Canadian citizens may also apply for the Rockefeller Foundation fellowships. The fellowships in radiological research are not limited to United States citizens. British scientists may apply through the British Empire Cancer Campaign for the British-American exchange fellowships.

The closing date for applications is December 10, 1954. Information and forms may be obtained from the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue NW, Washington 25, D. C.

Why Some Sanitary Engineers Leave the Field

A 1951 study by Lyon showed that about 50 percent of all men who had completed undergraduate curriculums in the sanitary engineering area were employed in the profession in 1950. This means that slightly less than 50 percent of those graduates were not working in the sanitary engineering field at the time of that study.

This finding was especially significant in the light of the results of a later report by Lyon and Miller in which it was shown that only one-third of all practicing sanitary engineers had had any formal sanitary engineering education. A sharp contrast was presented between the vocational choices of men with formal sanitary engineering education and the educational background of practicing sanitary engineers. This contrast raised important questions about the flow of qualified men into the profession.

The purpose of the present study was to find out why half of those who studied sanitary engineering as undergraduates were not practicing in the profession in 1950.

Interviews were conducted with a sample of graduates some of whom were currently employed in sanitary engineering. The remainder had occupations in other fields. In addition, undergraduate students taking sanitary engineering options and courses at several schools were interviewed.

The majority of the men currently employed in fields other than sanitary engineering had never actually left the field of sanitary engineering; rather, they had failed to obtain jobs in this field immediately after graduation. An investigation of the reasons for failure to accept jobs in sanitary engineering upon graduation established that, with a few exceptions, all of the groups (students, graduates in sanitary engineering, and graduates out of sanitary en-



Public Health MONOGRAPH

No. 21

The accompanying summary covers the principal findings presented in Public Health Monograph No. 21, published concurrently with this issue of Public Health Reports. Dr. Rosenstock is a social psychologist in the Experimental and Evaluation Services, Division of General Health Services of the Public Health Service. Mr. Miller, a sanitary engineer director, formerly acting chief of the Division of Engineering Resources, is acting executive editor of Public Health Reports.

Readers wishing the data in full may purchase copies of the monograph from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. A limited number of free copies are available to official agencies and others directly concerned on specific request to the Public Inquiries Branch of the Public Health Service. Copies will be found also in the libraries of professional schools and the major universities and in selected public libraries.

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Rosenstock, Irwin M., and Miller, Arthur P.:
Why some sanitary engineers leave the field. Public Health Monograph No. 21 (Public Health Service Publication No. 359). 20 pages. Illustrations. U. S. Government Printing Office, Washington, 1954. Price 20 cents.

gineering) desired much the same characteristics in jobs and had similar perceptions of the typical sanitary engineering job. These exceptions at best explain the loss to the profession of only a few individuals.

About half of the total group of graduates studied reported that they had not received a single job offer in sanitary engineering about the time of graduation. Of the men who did receive a job offer in sanitary engineering, a large majority accepted the job and are still working in the field; on the other hand, the majority of men who received no offers in sanitary engineering accepted jobs out of the field and have remained out.

The fact that half the graduates received no job offers in sanitary engineering can only be attributed to two possibilities: Either the jobs were not available or there were problems in the communication of job information from prospective employers to graduates. Some data presented in the report suggest that the availability of jobs varied from decade to decade; there may have been few jobs available when some classes were graduated. On the other hand, the study revealed that students and graduates generally fail to learn the most effective ways of finding the jobs that do exist.

There is additional evidence that students do

not have stronger preference for jobs in sanitary engineering than for those in straight civil engineering. They do not appear to perceive greater professional opportunities in one field than in the other. They tend to accept the first good offer regardless of whether it is in the field of sanitary engineering or straight civil engineering.

These findings suggest:

1. That the profession, particularly through its teachers, present the undergraduate student with a more adequate picture of sanitary engineering work, its specialties, its possibilities, and its future than has been done in the past. It is especially important to include those areas in which students appear to be poorly informed.

2. That special efforts be made to increase the feeling of belonging to the sanitary engineering profession in students who have shown by choice of option or curriculum a preference for sanitary engineering. This might be accomplished by providing such students with professional contacts and experiences.

3. That efforts be made to supply senior students (and graduates) with complete information on available jobs in all sanitary engineering activities. Employers should be encouraged to make firm job offers to graduating students at the earliest possible moment.

Indian Health Services Transferred to PHS

Provision of health and hospital services for Indians will become the responsibility of the Public Health Service July 1, 1955. The transfer of these activities from the Department of the Interior has been authorized by Congress in the bill H. R. 303 (P. L. 568), signed by the President August 5, 1954. The law does not affect the general education and welfare programs for Indians.

Approximately 400,000 Indians who are registered as members of the estimated 250 tribes in the United States, as well as the Indians and other natives of Alaska, qualify as beneficiaries for medical services under Fed-

eral auspices. Indians are located in 47 of the 48 States.

At present, about 100 Public Health Service physicians, nurses, dentists, pharmacists, and sanitary engineers are on detail to hospitals, health centers, and clinics maintained on behalf of the Indian population.

The Health Branch of the Bureau of Indian Affairs now operates 58 hospitals with 3,792 beds, 15 health centers offering outpatient services, and 2 public health units on the Pima-Pagago and the Navajo Reservations. About 64 public health nurses of the bureau are engaged in home care and community health activities.

"Lost historical data keep coming into our ken." Unless further evidence is produced, this paper establishes April 15, 1894, as the date when the work of the first State board of health diagnostic bacteriological laboratory was begun—in Louisiana at New Orleans. Minnesota can claim credit for having established the first State board of health chemical laboratory—in 1873.

The First State Board of Health Laboratories in the United States

By BEN FREEDMAN, M.D., M.P.H.

ALTHOUGH no truly comprehensive and detailed history of public health in the United States has been compiled, much has been sporadically written. Important dates have been recorded; famous personalities have been eulogized and their contributions set forth in historical perspective; and the origin and development of major movements have been traced in the light of our social growth. But the writing of history is never finished. The past is continually being perceived through new eyes, and lost historical data keep coming

Dr. Freedman, director of the public health training center of the Louisiana State Department of Health and assistant professor of tropical medicine and public health, Tulane University Medical School, has held a number of offices in the Southern Branch of the American Public Health Association, of which he was president in 1950-51. Dr. Freedman has been equally active in Louisiana public health organizations and parish medical societies. His report on the APHA Southern Branch experiment with curbstone consultation appeared in the December 1953 issue of Public Health Reports, p. 1213.

into our ken. The research behind this study concerning the establishment of State board of health bacteriological and chemical laboratories in the United States emphasizes the fact that much more collective effort will be required before a satisfactory history of public health will be written.

Perhaps this study may help alert us to some of the deficiencies in our published historical compilations and may stimulate the various health departments over the country to examine their histories in greater detail and to compile in comprehensive form the important events in their development. A reliable history of public health in the United States can be accomplished only by such collective effort. The need for such history is important only to the extent that history in general is important: first of all, as an instrument of the scholar and student, and second, as a source of inspiration to achievement for public health workers by the creation and maintenance of the highly charged professional esprit de corps which is necessary for farsighted, progressive, forward movement.

The significance of the circumstances that leads to the establishment of a new institution is often forgotten after the innovation becomes

firmly rooted in social practice. Those who record such events as observers or participants on the scene of action usually have perspectives quite different from those of later historians who see the events in the stream of social movement. Those with no developed sense of history scarcely comprehend existing institutions but merely take them for granted in the routine of living and working. The circumstances which led to the establishment of board of health chemical and bacteriological laboratories are the point in question.

The revolution in medical and public health sciences ushered in by Pasteur's discoveries after the midmark of the 19th century was turbulent and contentious for many years. The pioneers who actively carried the torch of the science of bacteriology were the exceptional men of their time. Their intellectual and emotional struggles occasioned by staking their reputations and livelihoods in supporting this unpopular movement have been amply recounted.

"Firsts"—Municipal Laboratories

Winslow (1) has affectionately related the vexing problems encountered by the great Dr. Hermann Biggs in establishing the first public health diagnostic bacteriological laboratory in the United States, in New York City on May 4, 1893, consequent to his appointment on September 15, 1892, as chief of the newly created division of pathology, bacteriology, and disinfection of the New York City Board of Health. This epoch-making event has been further described in detail in Oliver's biography (2) of Dr. William Hallock Park, the first director of this laboratory. This achievement by a municipal board of health has become a landmark in American public health development.

Although the New York City Board of Health bacteriological laboratory has been accepted as the first such laboratory in the United States with diagnostic functions, it was not the first municipal bacteriological laboratory in our country.

According to Gorham (3), "The first municipal laboratory in this country was established in Providence in 1888 by Dr. G. T. Swarts, who

was then medical inspector under Dr. C. V. Chapin. At first, this laboratory undertook only the study of water supplies and filters, and made an investigation of a typhoid epidemic caused by a polluted water supply, but later developed the general diagnosis work of a public health laboratory."

Chapin (4) himself makes the following statement:

"A bacteriological laboratory was set up in Providence by Dr. Swarts in 1888, which was utilized in the study of the typhoid outbreak of that year. The first diagnostic laboratory, however, was that of New York City, where Dr. Biggs offered to assist in the diagnosis of diphtheria in 1893."

Rhode Island's Early Start

The establishment of the first State board of health bacteriological laboratory with diagnostic functions has, in the past, been credited to Rhode Island. Recognized for his important contributions as a worker on the staff of the Providence Board of Health, Dr. Swarts, Gorham reports (3), "was later elected secretary of the Rhode Island Board of Health, and on September 1, 1894, he established the first state laboratory."

In the 1894 report of the Rhode Island State Board of Health (5), the following statement appears (p. 3):

"The free examination of sputum for physicians, in doubtful cases of tuberculosis, was commenced, as also the examination of secretions from the throats in cases of diphtheria."

In describing the action of the board at its regular January meeting in 1894, the same report relates (p. 4):

"In the near future it is the desire of the Board to establish regular and systematic bacteriological analyses in different forms of contagious diseases, and to have at their command a ready means of establishing a diagnosis by that means in such diseases as diphtheria, typhoid fever, tuberculosis and cholera. It will, therefore, be necessary to have in constant working order a properly equipped laboratory for this purpose. Such a laboratory could be equipped at a small expense."

At the regular July 1894 meeting of the

board, the secretary, Dr. Swarts, was authorized to use some of a \$1,000 fund which had been appropriated by the State legislature (5, p. 147) in January 1894 to make a study of "Tuberculosis in Man" for the "examination of sputum for physicians in establishing a diagnosis of the disease . . ." (5, pp. 5-6). Thus, the money became available for establishing a bacteriological diagnostic laboratory.

A short span of time elapsed between making the funds available and the actual establishment of the laboratory. At the quarterly meeting of the board of health in October, the secretary reported that "he had prepared and sent to all the physicians in the State, circulars of explanation of the intentions and desires of the Board, and asking for their cooperation in reporting cases of consumption or tuberculosis. A circular was also sent giving suggestions as to the care of the sputum, and one explaining the best method for collecting the same, and also blank reports in two forms, one for cases where the sputum was to be examined and to accompany the sample when sent in, and also one for cases when only the history of the case was necessary" (5, p. 6). The latter circulars were sent to the physicians on September 1, 1894 (5, pp. 148-9). This is the date for the establishment of the Rhode Island State Board of Health diagnostic bacteriological laboratory given by Gorham in his history of bacteriology, published as a chapter in *A Half Century of Public Health* (3).

In the 1894 report, the Rhode Island State Board of Health gave full credit to the diagnostic laboratory program of New York City and stated that it patterned its report forms after those used in New York City (5, pp. 6, 8).

Winslow states that "by the end of 1894, Brooklyn, Boston, Washington, Philadelphia, St. Louis, New Orleans, Albany, Newark, Buffalo, Rochester, and Hartford had followed New York in employing the bacteriological diagnosis of diphtheria." This statement (1, p. 110) illustrates what a powerful influence Hermann Biggs had all over the country in the practice of public health. It also implies that the boards of health of the variously mentioned cities were the agents which established these laboratories, and that is true for all the cities mentioned except New Orleans.

Louisiana, the Pioneer

New Orleans had no permanently established board of health until 1898. Before this, New Orleans had no municipal board of health for about a half century, depending entirely for public health counsel during this interval on the Louisiana State Board of Health, which had been established in 1855 (6) and which had been domiciled in New Orleans since its establishment. New Orleans was the capital of Louisiana up to 1849 and has continued to domicile some State agencies down to the present time.

What then, were the circumstances that led to the establishment of a diagnostic bacteriological laboratory in New Orleans?

The Louisiana State Board of Health appointed a "laboratory committee" in 1892 with Dr. Felix Formento as chairman for the specific purpose of creating a bacteriological laboratory. Dr. Formento had for many years been a very active member of the American Public Health Association (he was its president in 1892), and he was a pioneer in pushing bacteriological knowledge to the fore.

On January 12, 1893, the laboratory committee reported (7a, pp. 76-77):

"The establishment of a bacteriological laboratory, such as we now urge, will still further enhance the value of the scientific work undertaken by this board and will be of immense benefit to the public health. It has become indispensable. Its cost and maintenance will be trifling in comparison to the immense advantage to be derived from it."

Concerning the prospect of establishing the laboratory, Dr. S. R. Olliphant, president of the Louisiana State Board of Health, wrote (7a, p. 74):

"With the view of making more certain the diagnosis of such cases [diphtheria], as well as suspicious cases of other infectious diseases, the Board of Health has decided to institute a system of bacteriological research by the establishment of a bacteriological laboratory, where, through the medium of microscopical examination of cultures made from secretions of diseased persons, a correct diagnosis can be reached. The work is now in process of arrangement and will shortly be far enough advanced to enable

the Board of Health to determine through its bacteriologist a positive diagnosis in all cases which may be submitted by the attending physician."

The members of the State board of health were thoroughly acquainted with the bacteriological progress being made in Europe and America and with Dr. Biggs' organizing efforts in New York City. Some of its members traveled extensively to gain information in these matters. (Dr. Formento in 1882 presided at one of the important sessions of the International Hygiene Congress in Geneva as one of the presidents *d'honneur*.) This is exemplified by the report dated January 12, 1893, by Dr. Formento and Dr. G. Farrar Patton, who composed the laboratory committee of the board. "We were surprised during our late visit to Mexico, to see that even municipal boards of health, such as those of Puebla, San Luis Potosi, and similar localities, were provided with well organized and fully equipped bacteriological laboratories, under the charge of scientific men of great talent" (7a, p. 76).

Not the City of New Orleans

During this period, public health organization and administration were still in a formative and fluid stage of development. Some misconceptions in these matters were widespread. The laboratory committee appeared to be just as unclear about the organizational relationships between the boards of health of other large cities in the United States and their corresponding State boards of health as other public health officials were unclear about the organizational relationship of the Louisiana State Board of Health and the city government of New Orleans.

As Winslow points out (1), a number of boards of health of large cities had followed the example of the New York City Board of Health and had established municipal bacteriological laboratories by 1894. But it was the Louisiana State Board of Health and not the city of New Orleans which established the bacteriological laboratory in New Orleans, the city where the State board of health was legally domiciled and which contained a large portion of the State's population. Just as Winslow

misconstrued the New Orleans laboratory to be a municipal creation, so the laboratory committee of the Louisiana State Board of Health in its January 12, 1893, report misconstrued the municipal laboratories, such as mentioned above, as being creations of State boards of health.

This is evident from the following quotation of the laboratory committee in its report (7a, p. 76) of the year previous to the establishment of its laboratory:

"The Louisiana State Board of Health is perhaps the only State board in the United States which does not possess such a laboratory. Is it not time, full time, we should place ourselves on the level of smaller and far less important organizations? Should New Orleans remain any longer in the rear rank among the progressive and enlightened cities of our country?"

The State board of health laboratory committee was speaking of creating its "State" laboratory in New Orleans. As mentioned before, the city had no board of health at that time to act in such matters.

In the biennial report of the Louisiana State Board of Health for 1894-95, which was written early in 1896, the following was recorded by the president, Dr. S. R. Olliphant (7b, p. 77):

"In the last report [1892-93] of the Board of Health the early establishment of a Bacteriological Laboratory was promised. This laboratory has now been in practical operation two years, and under the able management of Dr. P. E. Archinard has been of great benefit to the medical profession and to the public."

The report contains Archinard's report on the laboratory, which recounts the history of bacteriological discoveries relating to diphtheria, and then states (7b, p. 121):

"With the knowledge and appreciation of those recent discoveries and investigations at the suggestion and owing to the energetic efforts of Dr. F. W. Parham, then chief sanitary inspector, and Dr. Felix Formento, chairman of the laboratory committee, the Louisiana State Board of Health decided, in February, 1894, to establish a bacteriological laboratory. . . . Owing to the lack of funds, the regular work of this laboratory was inaugurated only on the 15th of April, 1894, and the amount

of material sent and submitted to us for examination since then serves to testify better than words as to the usefulness of this measure."

Thus, it is quite clear that the Louisiana State Board of Health established a diagnostic bacteriological laboratory 4½ months prior to the one established by the Rhode Island State Board of Health.

Archinard was well acquainted with the work of Hermann Biggs and William Hallock Park in New York City. Realizing the need for further observation and experience, Archinard requested, and was granted, in November 1894, a 6 months' leave of absence from the Louisiana State Board of Health so that at his own expense he might visit the centers of Europe, study the effects of diphtheria antitoxin, and report as to its value. After leaving New Orleans, he visited New York and then Paris, Berlin, and Höchst near Frankfurt. His report to the board on his return is a concise statement of the knowledge concerning diphtheria antitoxin known to that date.

Because it lacked funds and facilities, the laboratory served only New Orleans and the surrounding area in its first few years of existence. After the 1898 reorganization of the Louisiana State Board of Health, it extended its services statewide.

Minnesota and Dr. Hewitt

The preceding facts having come to light, it seemed reasonable to question whether other States may have "hidden" histories of their laboratories which might elucidate the subject. Therefore, to every State health department, queries were sent requesting information about the dates of the establishment of their diagnostic bacteriological laboratories and also about the dates of the establishment of their chemical laboratories. All States and the District of Columbia replied, some with excellent elaboration of the history of their laboratories. The accompanying table summarizes the results of the answers received.

The response from Minnesota was very revealing. It threw a new light on the early history of public health laboratories in the United States.

From information provided by Dr. Henry

Bauer, director of the division of medical laboratories in the Minnesota State Health Department, there appears to be some unclarified but intriguing events in the history of the Minnesota State Board of Health concerning the matter of the establishment of its laboratories. Upon examining the biennial reports of the Minnesota State Board of Health between 1884 and 1902, many of the events relating to the establishment of its laboratories became clear. These events centered around Dr. Charles N. Hewitt, undoubtedly a great man, whose pioneering work has not found its way to the fore in the historical literature of public health in the United States.

Dr. Hewitt fathered the establishment of the Minnesota State Board of Health and served as its secretary for the first quarter century (1872-97) of its existence. It appears that he was the first professor of public health in the United States, having been appointed to that chair at the University of Minnesota in 1873 (8b, p. 18; 9), 8 years after Pettenkofer's appointment (10) in Munich (1865), and 13 years after Parkes' appointment (11) in England (1860). According to Hewitt, he set up a laboratory (8a, p. 18) in 1873 for the purpose of making chemical examinations of water supplies and foods. This appears to be the first such State board of health laboratory in the United States. He was president of the American Public Health Association in 1888. He was an energetic, brilliant, farsighted leader in the public health movement in our country. He states that he had requested "permission" from his board in 1873 to allow him to set up a laboratory in his office for doing various types of chemical analyses of water and food (8a, p. 18).

As was the practice of most scientists in the United States in those days who were interested in bacteriological work, Hewitt took leave between November 1889 and June 1890 to visit many of the famous European bacteriological laboratories and actually to work in some of them. The main functions of his laboratory consisted of chemical analysis of water supplies, foods, and other products, and microscopic examination of water for the presence of "low forms of animal and vegetable life." Some microscopic diagnosis of trichinosis was done, and some bacteriological investigations

were made, the nature of which Hewitt did not state, and the number of which was apparently small and sporadic.

Hewitt wrote the following in the 1893-94 biennial report (8b, p. 18) :

"Early in the work of the State and local boards of Health, the secretary [Hewitt] was frequently called upon for the chemical analysis of suspected water supplies, and by permission of the Board, established [in 1873] a small laboratory in his office. . . . Thus the chemical laboratory became a very important help in the every day work of the secretary's office. A few years ago, when the causes of many diseases were found to be associated with bacteria . . . it became necessary to apply the results of bacteriological study to discovery and diagnosis of disease. The work of this department has increased more rapidly than the chemical. . . . In 1893, he [Hewitt] was permitted to add these laboratories to this department, and in 1894, the office of the board was removed to St. Paul [from Red Wing]. In the same year the University [at Minneapolis] gave him permission to fit up some unfinished rooms, one of which has been assigned to use of the laboratories. . . . At this date, December 31, 1894, the laboratories are doing . . . regular work . . . [in] the examination of membranes or secretions of persons suspected to have diphtheria, by cultivation, staining and the microscope . . . [and in the] examination of sputa or tissue for diagnosis of tuberculosis."

Hewitt elaborates further on his bacteriological diagnostic work and the status of the bacteriological laboratory in the following year's report (8c, p. 13) :

"I [Hewitt] began these [laboratory] examinations in October 1894, and continued them until the establishment of the bacteriological laboratory under Dr. Westbrook. During that time I examined 709 specimens for diphtheria; found the Klebs-Loeffler in 244, mixed cultures in 28, no Klebs-Loeffler in 79, and cocci only in 160. These samples were from sixty-two localities and forty-one counties.

"From October 1894 to April 1896, I made 208 examinations of tubercular sputa from forty-one localities and twenty-seven counties. Found the bacillus tuberculosis in sixty-two samples, none in 105, and the rest doubtful.

"Since the establishment of the bacteriological laboratory all specimens have been sent there."

The First Official Bacteriologist

Although Dr. Hewitt's initiative, energy, and vision brought him into the position as the first bacteriologist for his board, the first "official" bacteriologist was not appointed until 1896 (8d, p. 119) :

"In 1896, Dr. F. F. Westbrook, of Minneapolis, was made a member of the board, and in April of the same year he was elected to serve as bacteriologist. At this time the bacteriological work of the board was transferred from Dr. Hewitt's laboratory to rooms assigned for this special work in the laboratory building of the Medical Department of the University. The Chemical work of the board was continued under Dr. Hewitt's direction."

Dr. F. F. Westbrook, the director of the new laboratory, wrote in the First Annual Report of the Bacteriological Laboratory of the Minnesota State Board of Health (1896), which appeared as a chapter in the 1895-96 biennial report (8c, p. 33) :

"As the board is aware, although the appointment of a bacteriologist was made at the last annual meeting, it was not until the April [1896] meeting that any steps were taken toward furnishing or equipping a laboratory. At the meeting in April, plans were submitted and approved for certain furnishings, which were, however, subsequently modified so as to prepare only a part of the large room placed at the board's disposal by the state university for use. It was impossible to obtain at this or any subsequent meeting an expression of opinion as regards the scope of the work to be performed in the laboratory. On this account no official announcement could be made as to what the laboratory was prepared to do and the work, therefore, has consisted in doing whatever came at hand. . . .

"It was found that the laboratory with these materials [equipment] from Dr. Hewitt's chemical laboratory was so far from equipped that, at the meeting in July [1896], a requisition was brought before the board for further supplies in the way of apparatus. This was passed and the materials ordered."

"Up to this time, very little work had been attempted, and the little accomplished was done in the laboratory of pathology and bacteriology of the University of Minnesota."

Thus, Dr. Westbrook continued (8c, pp. 34-35), "Dependent upon the reasons previously stated, work was not properly begun until July [1896], so that the list given below represents at most not more than six months' actual work . . ." The following is a summary of the examinations Dr. Westbrook reported as having been made before January 1, 1897:

Month	Examinations
May	12
June	12
July	38
August	46
September	59
October	160
November	284
December	312
Total	925

The date which the Minnesota State Board of Health fixes as the date for the establishment of its bacteriological diagnostic laboratory is April 1896. This was the date that Dr. Hewitt ceased doing this work for the board. The following month, May, was the first date that the first annual report lists as the beginning of its services. It was early in this year, 1896, that the bacteriologist and director of the laboratory, Dr. Westbrook, was employed. Yet there is no doubt that Dr. Hewitt began to do diagnostic bacteriological work for the board in October 1894 in the chemical laboratory that he established in 1873. The official date recognized by the Minnesota Board of Health, as recorded in the index of its 1901-2 biennial report, is therefore a year and a half later than the actual date when Dr. Hewitt began this work for the board.

Some Questions for Answering

Further research on the development of the Minnesota laboratories is in need of being done. This can best be accomplished in Minnesota by the State health department or the State university where records generally not available outside the State may exist. The following are

some of the questions which need answering:

Was the Minnesota State Board of Health's "permission" to Hewitt to set up a chemical laboratory in his office an "official act" by the board in establishing a laboratory? If Hewitt's laboratory were official, and he began to do bacteriological work in this laboratory in October 1894, would this, rather than April 1896, be the correct official date of the establishment of its bacteriological diagnostic laboratory? In other words, did Hewitt's chemical laboratory also become a bacteriological diagnostic laboratory?

There is also a need, in the light of the above findings, to make further inquiry into the history of the establishment of municipal board of health laboratories to confirm the records as to the priority (1888) of Providence, R. I., in having established the first bacteriological laboratory.

This is indicated since there was an obvious need and pressure for establishing laboratories as adjuncts to public health practice prevalent among leaders in public health administration at the time of Providence's forward step in this direction. This need is illustrated by the fact that the New York State Board of Health established its chemical laboratory in 1881, that the Kansas State Board of Health bought a microscope in 1886 for laboratory work, that the Maryland State Board of Health appointed a chemical analyst in 1887, and that Dr. Victor Vaughan, as president of the Michigan State Board of Health, and with the cooperation of that board, requested in 1887 funds from the Michigan Legislature to establish at Michigan University a hygienic laboratory, which was opened in 1889. What was going on among municipal boards of health at that time?

Four Conclusions

From the foregoing it can be concluded that:

1. The Louisiana State Board of Health declared to create a diagnostic bacteriological laboratory in February 1894, but the regular work of the laboratory began on April 15, 1894. So far as the available records show, this was the first State board of health diagnostic bacteriological laboratory in the United States.

Dates of establishment of various State boards of health, their diagnostic bacteriological laboratories, and their chemical laboratories

State	Date of establishment of board of health	Date of establishment of diagnostic bacteriological laboratory	Date of establishment of chemical laboratory	State	Date of establishment of board of health	Date of establishment of diagnostic bacteriological laboratory	Date of establishment of chemical laboratory
Alabama	1875	1899	(1)	Montana	1901	1917	1911
Arizona	1903	1912	1912	Nebraska	1891	1913	1913
Arkansas	1913	1917	1917	Nevada	1893	1939 ¹³	(14)
California	1870	1905	1905	New Hampshire	1881	1901	1901
Colorado	1893	1921 ²	3 1951	New Jersey	1877	1895	1895
Connecticut	1878	1905 ⁴	1905	New Mexico	1919	1920	1951
Delaware	1879	1899	1899	New York	1880	1901	1881
District of Columbia	1871	1911	1893	North Carolina	1877	1907	(15)
Florida	1889	1902	(5)	North Dakota	1889	1917	1917
Georgia	1903	1905	1910	Ohio	1886	1898	1898
Idaho	1907	1909	1909	Oklahoma	1890	1915 ¹⁶	17 1915
Illinois	1877	1904	1917	Oregon	1903	1903	1927
Indiana	1881	1905	1905	Pennsylvania	1885	1906	1919
Iowa	1880	1925 ⁶	1925	Rhode Island	1878	Sept. 1, 1894	1900
Kansas	1885	1920	(7)	South Carolina	1878	1909	(18)
Kentucky	1878	1910	1910	South Dakota	1895	1909	(19)
Louisiana	1855	Apr. 15, 1894 ⁸	1891	Tennessee	1877	1914 ²⁰	1944
Maine	1885	1903	1903	Texas	1909	1912	1925
Maryland	1874	1910 ⁹	10 1910	Utah	1898	1926	1941
Massachusetts	1869	1895	1891	Vermont	1886	1898	1898
Michigan	1873	1907	1907	Virginia	1872	1908	1908
Minnesota	1872	Dec. 31, 1894 ¹¹	1873	Washington	1891	1907	1907
Mississippi	1877	1910	1937	West Virginia	1881	1914	1914
Missouri	1883	1910 ¹²	1936	Wisconsin	1876	1903	1903
				Wyoming	1901	1939	(21)

¹ The Alabama State Department of Health has no chemical laboratory.

² A bacteriologist was appointed by the Colorado State Board of Health in 1899.

³ A limited chemical laboratory was set up in 1946 for the occupational health section of the Colorado State Department of Health.

⁴ On July 1, 1889, the Connecticut State Board of Health furnished funds to Yale University to carry on chemical, bacteriological, and microscopic analysis of water supplies as part of a water pollution investigation program. There is no evidence that this was a bacteriological, diagnostic laboratory.

⁵ The chemical laboratory in Florida is under the State department of agriculture.

⁶ A State bacteriological laboratory, which was required to carry out examinations requested by the State board of health, was established by legislative act at the College of Medicine, State University of Iowa, in 1903.

⁷ In 1886, a food and drug laboratory, which was closely associated with the State board of health, was set up at the Kansas State College. The division of sanitation established a chemical laboratory in 1914 to do water analyses. In 1953, the State board of health laboratory became the official laboratory for food and drug work.

⁸ The Louisiana State Board of Health bacteriological laboratory was officially declared as of the date February 1894, but because of lack of funds it was not set up until April 15, 1894.

⁹ In 1898, a legislative act provided the services of a bacteriologist.

¹⁰ As early as 1887, a chemical analyst was provided by the Maryland State Board of Health.

¹¹ The exact date for the establishment of the diagnostic bacteriological service of the Minnesota laboratory is not clear. Early documents indicate that the date was in October 1894.

¹² A State bacteriologist was appointed in 1906, but the laboratory was not established until 1909.

¹³ The Nevada State Hygienic Laboratory was established in 1909 and placed under the supervision of the State university.

¹⁴ Chemical laboratory work is done at the State university laboratory.

¹⁵ The chemical laboratory in North Carolina is in the State department of agriculture.

¹⁶ A State bacteriologist was appointed in 1907.

¹⁷ A State chemist was appointed in 1910.

¹⁸ South Carolina State department of health has no chemical laboratory; it uses private laboratories.

¹⁹ In South Dakota, the State chemical laboratory is in the State department of agriculture.

²⁰ On Jan. 5, 1897, the first Tennessee State Board of Health bacteriologist was appointed.

²¹ In Wyoming, the State chemical laboratory is not in the State department of health; however, in 1945, the State legislature established an industrial hygiene service under the State board of health and set up a chemical laboratory in connection with this service.

2. Minnesota's own official records recognize the date of April 1896 as the time of the establishment of its diagnostic bacteriological laboratory, although Dr. Charles N. Hewitt actually began this work in his chemical laboratory in October 1894 as part of the laboratory's routine activities. The nature of Hewitt's laboratory must be further explored. Was his laboratory officially established by the State board of health for the purpose of doing diagnostic work, or was the diagnostic work in the laboratory developed by the industry, intelligence, and great vision of Hewitt before official action was taken by the board?

3. The fact that the Minnesota State Board of Health allowed the statements of the establishment of Hewitt's chemical laboratory to appear in its biennial reports of 1884-86 and 1893-94 will tentatively be interpreted as having been acknowledgment of official action by the board, and, therefore, until further evidence is produced, the Minnesota board should be credited with having been the first State board of health to have established a chemical laboratory in the year 1873.

4. There is need for the establishment of a committee on the history of public health in the United States and for the enlistment of the departments of health all over the country to cooperate in such a project.

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New Tuberculosis Beds In the United States In June 1954

In the United States and its Territories more than 2,600 new tuberculosis beds have recently been or are being constructed with State appropriated funds, according to information made available in June 1954 to the Division of Special Health Services, Public Health Service. The new beds are in addition to 114,500 (1) beds which represent the official rated capacity for care and treatment of tuberculosis patients as of April 1953. In the latter part of 1953 two States alone, Illinois and North Carolina, added nearly 600 of the 2,649 new beds. Ten States will be responsible for the addition of the remaining new beds. In these States, plans for construction have been approved, and construction is under way or has been completed. The greater part of this construction is being carried out with the aid of funds provided by the Hospital Survey and Construction Act. The table shows the distribution of these beds by State.

It has come to our attention, moreover, that apart from the 2,649 beds being constructed with State funds, approximately 700 more tuberculosis beds are under construction for which no financial assistance is being provided by State governments.

This increase in the number of beds for the treatment of tuberculosis is a continuation of

the upward trend which started when Trudeau built his first small sanatorium at Saranac, N. Y., in 1885, a trend which has continued unbroken since then. The net increase in non-Federal tuberculosis beds between January 1, 1952, and April 1, 1953, was about 2,650. This is an actual increase since it does not include replacement beds (the 2,649 new beds discussed in paragraphs 1 and 2 may include replacement beds).

Tuberculosis beds constructed or to be constructed with State appropriated funds in addition to the beds shown in the Public Health Service tuberculosis bed index, Apr. 1, 1953

State	Number of hospitals	Number of tuberculosis beds
Total-----	15	2,649
Alabama-----	2	302
California-----	1	287
Idaho-----	1	50
Illinois-----	1	483
Kansas-----	1	75
Michigan-----	2	250
Missouri-----	1	69
North Carolina-----	1	100
Ohio-----	1	100
South Carolina-----	1	207
Tennessee-----	1	226
Texas-----	2	500

Some States have a sufficient number of beds for the care of their tuberculosis patients. In other parts of the country, however, the need for additional beds continues to be acute. In these places it is vital to the control of tuberculosis that more hospitalization facilities be provided.

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Prepared by the Tuberculosis Program, Division of Special Health Services, Public Health Service.

Group A Beta Hemolytic Streptococci And Rheumatic Fever in Miami, Fla.

By MILTON S. SASLAW, M.D., and MURRAY M. STREITFELD, Ph.D.

RHEUMATIC FEVER seems to behave differently in warm climates than in northern areas. In the south, polyarthritis and chorea are relatively infrequent (1). Rheumatic fever is less severe, and the incidence of rheumatic heart disease is lower, as indicated by surveys of school children (2, 3), necropsy reports (4, 5a), and a low acute rheumatic fever hospitalization rate. A study of 4 large hospitals in Miami, Fla., over a 4-year period showed an average admission rate of 0.3 patient per month with acute rheumatic fever.

The explanation for this difference between the rheumatic fever picture in the north and that in the south may lie in some alteration in the pattern of the etiological relationship presumed to exist between group A beta hemolytic streptococci and rheumatic fever:

1. The organism may vary in incidence, frequency, type, or virulence.

Dr. Saslaw is director of medical research and Dr. Streitfeld is bacteriologist at the National Children's Cardiac Hospital, Miami, Fla. This study was supported in part by funds from the Florida State Board of Health, with the cooperation of the Dade County Board of Public Instruction, the Dade County Board of Health, the Florida State Board of Health, and the Public Health Service. Grouping and typing of streptococci were performed by Dr. Elaine L. Updyke, bacteriologist-in-charge, Streptococcus Laboratory, Communicable Disease Center of the Public Health Service, Chamblee, Ga.

2. The immunological response of the host to the organism may differ either in degree or pattern.

3. The host-organism relationship may be otherwise altered.

This is a preliminary report on the number and types of group A beta hemolytic streptococci isolated from the throats of normal, healthy Miami school children, with a discussion of the problems raised by our findings.

Material and Methods

During the 4-month period from February through May 1953, a total of 1,154 pairs of throat swabs were taken at monthly intervals from 343 children residing in and attending grade 1 in three schools in Miami. Each child's throat was swabbed an average of 3.4 times. Written permission of the parents had been obtained for each child.

The schools were carefully selected to represent different socioeconomic levels: a low-income white group; a middle-income, relatively stable white population; and a mixed-income Negro group. A high-income group was not included because such a group in Miami does not maintain year-round residence, and therefore a long-term study would be impossible. The sample selected, though not truly random, represents the stable school population. It includes 83 percent of the 413 children attending grade 1 of the three schools in the study and is 3.8 percent of the 9,003 first graders attending all the public schools of Dade County.

Duplicate throat cultures were taken with sterile cotton swabs from all children present in school during the mornings set aside for this phase of the work. Nasopharyngeal swabs were not taken. All the swabbings were made by the same technician and required about 2 hours per morning.

The pair of swabs from each child was put into a sterile test tube immediately after being taken. When all the cultures had been collected, they were promptly taken to the laboratory. One swab was then streaked directly on Difco blood agar base (DBAB) enriched with 4 percent defibrinated sheep's blood, which was found to be preferable to a 5-percent concentration in revealing beta hemolysis (6). The second swab was initially cultured on a different medium each month for two reasons: first, to pick up additional isolates likely to appear on duplication; and second, to try to find a culture medium which would yield the highest possible number of isolates. In February, the second swab was initially cultured on Pike's (7) enriched medium, modified by the use of defibrinated sheep's blood in place of rabbit's blood and Todd-Hewitt broth (Difco) instead of fresh heart infusion. The following month, trypticase soy broth (BBL) was substituted for Todd-Hewitt broth (8). In April, the second swab was first cultured on Brewers' thioglycollate broth (Difco) and incubated for 6 hours at 37° C. Following incubation, the broth cultures for each of these 3 months were streaked with a transfer loop on DBAB enriched with 4 percent defibrinated sheep's blood. In May, the second swab was streaked directly on neopeptone heart infusion agar (Difco) containing 4 percent defibrinated sheep's blood.

All plates were incubated at 37° C. for approximately 24 hours and read with the aid of a microscope for the presence of beta hemolysis. In some cases in which beta hemolysis was questionable, several hours' additional incubation were required for a definitive reading.

Whenever a plate demonstrated colonies suspicious of beta hemolysis, subcultures were made to the surface of plates containing the same type of medium used for the initial plate. So that hemolysis could be viewed in deep as well as surface growth, a variation of Krumwiede and Kuttner's streak plate technique (9)

was used. This involved the pouring of additional medium over about one-fourth of the streaked plate.

Subcultures of typical colonies were made to slants of stock culture agar (Difco), to each 10.0 gm. of which were added 11.0 gm. neopeptone heart infusion agar (Difco) and 1.75 gm. agar. This medium was diluted to 200 cc. with distilled water, autoclaved at 120° C., 15-pound pressure, for 15 minutes, and then cooled to 45° C. After tubing in 5-cc. amounts in screw-capped tubes, approximately 0.3 cc. defibrinated sheep's blood was added to each tube, and the tubes were slanted. After overnight incubation of the subcultures at 37° C., the condensation fluid present at the bottom of the slants was gram-stained to check morphology. These slants were used as stock cultures for grouping and typing. Agglutination tests with serums for groups A through H and K through O were performed at the Streptococcus Laboratory, Communicable Disease Center, Chamblee, Ga. Type specificity was determined by the Lancefield precipitin method against types 1-6, 8, 11-15, 17-19, 22-26, 28-33, 36, 37, 39-44, 46, and 47.

Results

The number of groups and types of beta hemolytic streptococci isolated in our study are listed in tables 1 and 2. Fifty-eight children were found to have these organisms in their throats; in 14 instances children were found to be positive a second, third, or fourth time, giving a total of 72 isolates. Fifty-nine strains of group A beta hemolytic streptococci were isolated from the throats of 47 children. All of the 27 typable strains were type 12, with a single exception (type 28); in one child, type 12 was recovered in 2 successive months.

Group A beta hemolytic streptococci were not limited to the children of one school but were isolated from those attending each of the three schools studied.

Nine children had positive cultures more than 1 month: 2 months in 6 cases, 3 months in 1, and all 4 months in 2. Table 3 gives a breakdown of the findings in these 9 children.

Comparison of the number of positive cultures isolated with each of the various media used during the 4 months of the study yielded

Table 1. Grouping of beta hemolytic streptococci isolated from 1,154 throat cultures in 343 children over a 4-month period in Miami, Fla., 1953

Month	Number of children			Positive 1st time					Positive 2d, 3d, or 4th times			Total positive cultures		
	Total	Ab-sent	Present and cultured	Total	Group A	Other groups			Ng ¹	Total	Group A	Ng ¹	Number	Percent
						B	C	G						
February	343	64	279	8	7	1	—	—	0	—	—	—	8	2.9
March	343	35	308	9	8	1	—	—	4	—	3	1	13	4.2
April	343	62	281	20	11	5	3	1	—	5	5	—	25	8.9
May	343	57	286	21	20	—	—	—	1	5	5	—	26	9.1
Total	—	—	1,154	58	46	6	4	1	1	14	13	1	72	6.2

¹ Nongroupable.

the following data: In February, the modified enrichment medium failed to reveal any positive cultures, while on enriched DBAB 8 strains of beta hemolytic streptococci were recovered. The trypticase soy enrichment medium used in March picked up only 1 strain (nongroupable), in contrast to 12 strains isolated on enriched DBAB. However, the thioglycollate broth used in April was effective in the isolation of 8 strains which were not isolated on enriched DBAB. Neopeptone medium in May was responsible for the recovery of 7 strains not found on enriched DBAB. Had a single swab been taken and planted only on enriched DBAB, we would have missed 1 strain in March, 8 in April, and 7 in May—a total of 16 strains, or 22.2 percent of the 72 strains recovered. Double cultures on enriched DBAB might have yielded the same results as those obtained by the use of

other media. In our experience, it would appear that either thioglycollate broth or neopeptone heart infusion agar containing 4 percent defibrinated sheep's blood should be used as an initial culture medium, in addition to enriched DBAB. In the number of positive cultures or numbers of colonies demonstrated on original plates, none of the culture media used was found to be superior to DBAB containing 4 percent defibrinated sheep's blood.

Discussion

The finding of group A beta hemolytic streptococci in the throats of 16.3 percent of 343 children in Miami over a 4-month period is consistent with the 5 to 10 percent streptococcal rate reported by Denny (10) for the normal child population. It strongly suggests that

Table 2. Types of group A beta hemolytic streptococci isolated from 1,154 throat cultures in 343 children over a 4-month period in Miami, Fla., 1953

Month	Number of children cultured	Positive 1st time				Positive 2d, 3d, or 4th times			Total positive cultures	
		Total	Non-typable	Type 28	Type 12	Total	Non-typable	Type 12	Number	Percent
February	279	7	7	—	—	—	—	—	7	2.5
March	308	8	6	1	1	3	3	—	11	3.6
April	281	11	7	—	4	5	4	1	16	5.7
May	286	20	2	—	18	5	3	2	25	8.7
Total	1,154	46	22	1	23	13	10	3	59	5.1

Table 3. Nine children with repeatedly positive throat cultures, February-May, 1953

Month	Case number								
	2	54	102	139	353	380	604	667	686
February	A ₀	A ₀	A ₀	Negative	Negative	Negative	A ₀	C	A ₀
March	A ₀	Ng	A ₀	A ₀	A ₀	A ₀	Negative	Negative	A ₀
April	Absent	A ₀	Absent	A ₀	A ₀	A ₀	A ₁₂	do	A ₀
May	Negative	A ₀	do	Negative	Negative	Negative	A ₁₂	A ₁₂	A ₀

A₀—Group A beta hemolytic streptococcus, nontypable.

Ng—Nongroupable beta hemolytic streptococcus.

A₁₂—Group A, type 12 beta hemolytic streptococcus.

C—Group C beta hemolytic streptococcus.

factors other than the mere presence of this group of organisms in a geographic location play a role in their etiological relationship to rheumatic fever. Investigation over a longer period is essential for a more comprehensive picture of the behavior of streptococci in this subtropical climate. Such prolonged study would enable determination of the following points.

More accurate isolation data. If the study had run throughout the year, if we could have taken cultures at more frequent intervals than once a month, and if we had been able to culture the children absent because of illness, it is reasonable to presume that the number of isolates of group A beta hemolytic streptococci would have been greater. The peak recovery rate observed in April and May may have continued into June, as has been reported in a long-range survey in New York by Coburn and Pauli (11).

The finding of only one type (type 12) among the typable organisms (with a single exception, type 28) could be interpreted as indicative of either an isolated epidemic or the predominance of this type during the season studied. The streptococcal rate found in our study could represent either an epidemic or the incidence prevailing in Miami at the time and paralleling the seasonal variations noted elsewhere (11).

Infection rate. The present study was directed only toward finding the extent to which group A beta hemolytic streptococci are present in Miami, Fla. As no serologic tests were performed and there was no complete followup of all illnesses during the study period, it cannot be stated with certainty that the organisms

recovered were harmless parasites. There are certain indications, however, that they were pathogenic:

1. There was a shift from nontypable group A beta hemolytic streptococci in February and March to typable strains in April and May. That pathogenicity is related to typability has been reported by Rothbard and Watson (12).

2. The number of positive cultures increased in each succeeding month, reaching a peak in April and May. This finding parallels the seasonal streptococcal infection rates reported by Coburn and Pauli (11).

3. A preliminary followup study of 19 of the 25 children from whom type 12 was isolated indicated that for 13 either they or members of their families had upper respiratory infections. Of the remaining 6, 1 suffered from allergic symptoms and 3 from mumps. Only 2 were apparently free from any illness. In view of the possible relationship reported between viral diseases and streptococcal pathogenicity (11, 13), it is of interest that at the time of our study there were numerous cases of mumps and chickenpox in the schools.

Frequency of reinfection. The number and frequency of group A beta hemolytic streptococcal infections in Miami may be factors in the incidence of rheumatic fever there. The interval between infections also may have a direct bearing on whether or not rheumatic fever follows streptococcal infection.

Rheumatogenicity. Strains and types of group A beta hemolytic streptococci may vary in their ability to precipitate attacks of rheumatic fever (14), a quality we have termed "rheumatogenicity." Our future studies will

attempt to answer the question as to whether such variations in rheumatogenicity occur. To date, none of the 343 children in our study, not even those from whom streptococci were isolated, have developed overt symptoms of rheumatic fever. Moreover, during the 3-month period, June-August 1953, following the study only one child (not in our study) in the area was hospitalized for acute rheumatic fever, as shown in the records of two of the largest hospitals in Miami.

"Nephritogenicity." Rammelkamp and Weaver (15), in a review of the literature and on the basis of their own studies, found that attacks of acute glomerulonephritis generally followed type 12 streptococcal infection. None of the children in our study from whom strains of type 12 were isolated developed frank clinical manifestations of nephritis. However, since urine examinations and Addis counts were not performed, it is recognized that the existence of subclinical nephritic infections cannot be ruled out.

Lancefield's precipitin technique was used in the study for typing group A beta hemolytic streptococci. It is known (16) that type 12 organisms determined by this method include both types 10 and 12 when ascertained by Griffith's agglutination procedure, and it may be that only one of these types is nephritogenic.

Immunological response. The determination of serologic changes evoked by streptococcal infection, both clinical and subclinical, in relationship to rheumatic fever, is now under investigation in the laboratory of the National Children's Cardiac Hospital, Miami. Such data will aid in differentiating between pathogenic and possibly parasitic strains of group A beta hemolytic streptococci recovered. The pattern of immunological response to single and multiple streptococcal infections will be followed and compared with that observed in northern areas (5b).

The isolation of large numbers of group A beta hemolytic streptococci in Miami in our preliminary study has raised many provocative questions concerning the host-organism relationship in a subtropical climate. What is the significance of the presence of group A beta hemolytic streptococcus in the throat of a normal child? Does it evoke an increase in the

antistreptolysin-O titer? What effect, if any, does it have on the subsequent development of rheumatic fever, nephritis, or other infections, clinical or subclinical? To what extent are streptococcal infections followed by rheumatic fever in the southern States? Is the 3 percent figure quoted by Rammelkamp (15) valid here? Does residence in a subtropical climate alter the host's clinical or serologic response, or both? How is the pattern of immunological response related to the lower incidence of rheumatic fever in a southern climate?

Summary

1. Duplicate throat swabs were taken once a month from those present among 343 healthy school children in grade 1, Miami, Fla., during the 4-month period of February through May, 1953. In all, 1,154 pairs of throat swabs were collected, giving an average of 3.4 cultures per child and 288.5 children per month.

2. Based on the monthly average of 288.5 children studied, 20.1 percent (58 children) were found to harbor beta hemolytic streptococci in their throats at least once; 16.3 percent (47 children) had group A at least once; and 8.7 percent (25 children) had Lancefield's type 12 at least once.

3. An increasing number of cultures positive for group A beta hemolytic streptococci were found in each succeeding month of the study period. There was also a shift from nontypable isolates in February and March to typable strains in April and May.

4. Although the total number of children from whom streptococci were recovered was too small to warrant elaborate statistical analysis, it is of interest that followup studies revealed no frank cases of rheumatic fever or glomerulonephritis in the study group. Data collected on 19 children from whom the type 12 strain was isolated showed that upper respiratory infections occurred either in themselves or in their immediate families in 13 instances.

5. The importance of continuing and extending this epidemiological study over a period of years is emphasized to obtain further information on the behavior of group A beta hemolytic streptococci, their incidence and infection rates, the effect of streptococcal reinfections on the

incidence of rheumatic fever, "rheumatogenicity" and "nephritogenicity" of different types and strains, and the pattern of immunological response to these organisms in a subtropical climate.

ACKNOWLEDGMENTS

The authors wish to thank Drs. T. E. Cato, S. D. Doff, Albert V. Hardy, Alexander Langmuir, and Elaine L. Updyke, and Lilly Harman and the Dade County nursing staff for their active advice and cooperation; and Alba Colon for technical assistance.

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Legal Note on Meat Inspection Fees

A recent finding of the Court of Appeals of Ohio bears on the power of health departments in that State to charge fees for meat inspection.

In *Brunner et al. v. Rhodes*, 119 N. E. 2d 105, decided March 23, 1953, the Court of Appeals of Ohio held that under Ohio State law a board of health does not have the power by regulation to exact inspection fees from operators of slaughterhouses.

The court based its decision on the grounds that Ohio does not give boards of health this authority by direct statute or by strong legislative implication.

Health Education for Industrial Employees

at the

Hanford Atomic Products Operation

By CAESAR BRANCHINI, M.A.

MODERN INDUSTRIAL health programs strive to achieve something more than mere first aid for occupational injuries. An interest in the worker and his family beyond the boundaries of the plant is evident in the objectives of most forward-looking health plans. This idea was expressed by the Surgeon General of the Public Health Service in the following words (1):

"Modern industry is the logical partner of the health department in bringing the workers and their families all of the new and rapidly growing knowledge for preventing illness and improving health."

The benefits of adequate health programs in industry are realized by the employee as well as the employer. Better employee health, fewer accidents, reduced turnover, increased productivity, and lower compensation costs are among the benefits from such programs which have been reported by industry (2). Health education is a necessary function in those plans which

attempt to meet these broadened objectives. A growing recognition of this need is evident in the reports of many workers in the field (3-5).

The Hanford Program

An industrial health program which includes extensive provision for health education is carried out at the Hanford Atomic Products Operation, Richland, Wash.

The medical component of the company is uncommon in one chief respect. Because Richland, Wash., is a "Government town" operated for the Atomic Energy Commission by the General Electric Company, as is the Hanford Atomic Products Operation, all medical facilities for the town and the plant are administered by the company, including the hospital (Kadlec Hospital) and the local public health unit, which provide what would ordinarily be considered community services.

There are two other units in the health and safety section of the plant—a section in the employee and public relations department—which would not be so closely connected in a normal community as they are for the Hanford plant and the town of Richland. One of these is a safety unit, which is responsible for safety and fire protection, safety engineering, and safety education. The other is an industrial medicine subsection, which carries on a complete program

Mr. Branchini is the health educator at the Hanford Atomic Products Operation of the General Electric Company, Richland, Wash., and also secretary of the Washington State Public Health Association and president of the Benton-Franklin County Tuberculosis Association.

of preventive medicine, including pre-employment and periodic physical examinations, first aid and emergency care, industrial hygiene services, and health education.

Health Activities Committee

A planning and advisory group known as the health activities committee is the outstanding feature of the health education program at Hanford. This committee serves plant personnel in much the same manner that a community health council serves the community.

The advisory committee came into being as the result of a need on the part of the medical staff to know some of the real and imaginary health problems of the employees, their families, and their community. It was organized as an interpretive as well as an advisory group, its principle objective being the reduction of plant absenteeism through the dissemination of health information for the worker and his family.

Each member on the health activities committee is named by a department manager, thus assuring responsible representation by persons in a good position to assure adequate follow-through. Wide representation is assured by having all departments represented; some of these are, for example, the manufacturing, engineering, financial, and employee and public relations departments. The committee representatives consult with the department managers on health problems and are responsible for getting ideas and information from the employees. They are also responsible for the dissemination of health information within their departments.

Where experience has shown that the task of representing a particular department was too much for one person—either because of the size of the department or because the group was geographically scattered—the representation on the committee from the department has been increased. Currently, 3 departments have 3 representatives; and the other 3 departments have 1 representative each.

Serving as advisers to the group are the manager of the health and safety section, the manager of the industrial medicine subsection, and the chief of the public health unit. All are physicians.

The health educator acts as a permanent member of the committee. In this capacity, he directs the committee's activities and assures continuity of the health education program. He organizes and arranges special programs. In the average community, the health educator working in a city or county health department could well perform these functions. But because of the unique plant operations in the Richland community, the health educator is more closely allied to the industrial medicine unit of the plant.

Monthly meetings of the health activities committee are held. Any health or medical problems which have arisen among the employees or in the community are discussed at the meetings. Where real problems exist, a study is made, and the committee recommends a solution. Where misunderstandings exist, the discussion at the meetings usually clears the air. The committee then hears reports from members on past activities. Plant absenteeism reports are circulated for discussion, and the forthcoming health topic for the monthly health bulletin is reviewed by one of the medical advisers.

Health Bulletins

With the help of the medical advisers, the health activities committee selects the topic for each monthly health bulletin. Selection of topics is made on the basis of needs of employees, their interests, and other situations which may be of topical or seasonal importance. Interests may be observed by the committee representatives in their contacts with their own groups. Topical or seasonal problems which occur are treated regularly.

The wide representation on the health activities committee and the free discussion at meetings of the committee results in a selection of topics covering a broad range of health topics. Subjects covered in recent bulletins are: hay fever, overweight, stress and strain, heart disease, psychosomatic ailments, fatigue, anxiety, and emotional maturity. Topics planned for the near future are: colds, home and child safety, cancer, care of the eyes, hearing problems, and medical misinformation.

Preparation of the monthly health bulletin, after selection of the topic, is the responsibility



Display racks and bulletin boards provide a means for distribution of health materials at the Richland, Wash., atomic products plant. (Left) One information rack is located in the waiting room. (Right) Copies of the monthly health bulletin are being posted.

of the medical advisers and representatives of the employee and public relations department. The medical group provides the technical information, and the others organize the material, plan the layout, and arrange for printing and distribution.

The monthly bulletin is usually a highly attractive, easy-to-read presentation of the essential facts, which have been appropriately illustrated. The cover bears the title and a design which catches the eye and arouses curiosity and interest. Because of the wide range of job requirements, all educational levels are represented among the employees. Consequently, the contents of the bulletin must be simple enough for those with limited education, yet interesting enough to hold the attention of the many scientists and other highly educated personnel at the plant. The number of comments, questions, and requests for additional information that the bulletin provokes indicates that the material does meet these requirements.

Many techniques are used to increase the interest and readability of the bulletins. Material is arranged in short sentences and paragraphs for easy understanding. Spacing is adequate. The pages do not look "crowded." Technical words, when they are used, are explained. Essential points are made more vivid by the use of illustrations. Important points are numbered, set off, and summarized.

Publicity is given to the monthly health bul-



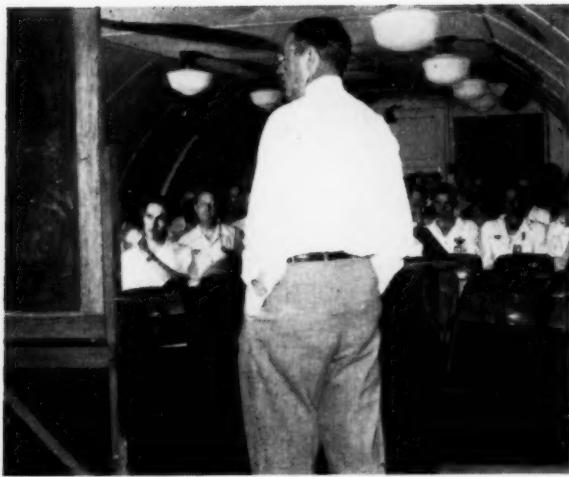
letin in the weekly plant newspaper and occasionally by poster displays. The bulletins are regularly distributed to 8,600 employees.

Other Activities

Monthly health and safety meetings are held for each unit or for smaller groups throughout the plant. At these meetings, the health topic is discussed by a leader, who may be the unit supervisor or one of the employees selected to lead the meeting on a rotational basis. All supervisors receive a copy of the bulletin through the plant mail system in advance of general distribution so that they may review the monthly health topic before it is brought up for discussion at the next meeting. When the supervisor does not lead the meeting, as often happens, he may give his advance copy to the employee who is responsible for leading the meeting. At the conclusion of the health and safety meeting, the health bulletins are generally distributed.

These meetings are not necessarily restricted to the designated health topic, however. If the meeting leader feels that another situation peculiar to his group deserves preference in discussion, that situation or subject, rather than the current health topic, may be discussed.

Also, by contacting his department representative, any employee may have any problem in which he is interested brought up for discus-



Health and safety meetings are held monthly at the Hanford Atomic Products Operation. (Left) A group supervisor discusses the health topic with the men in his unit. (Right) A small group is ready to watch a sound filmstrip on the current health topic.

sion at the health and safety meetings. And, as a matter of course, additional information is always available to the individual through regular plant medical facilities.

Speakers from the medical staff or from the public health profession are frequently invited to address health and safety meetings when there is a need for more professional or technical information than can be provided from within the groups. This adds interest to the meetings through a change of routine. Films are also made available for these meetings and are usually correlated with a talk.

The health activities committee also has contact with other plant and community groups and frequently works with these groups on problems of common interest. Home accidents constituted one such problem in which the plant safety unit cooperated with the committee. The two groups prepared a health bulletin which was printed as a joint endeavor.

Because the health bulletins almost invariably provide information of value for the entire family, employees are urged to take them home. Close relations with families are maintained by plant representation on the local community health council in order to encourage family participation in the plant health programs. As a result, cooperative programs with the community health council are frequently promoted. Typical programs which have had such joint promotion with the community health council

are the home accident prevention campaign, and two fairly extensive campaigns on colds and weight education. These campaigns will serve to illustrate the functioning of the health activities committee and reveal the means used by the committee in presenting health information.

Special Health Campaigns

At its October 1953 meeting, the committee reviewed monthly absenteeism graphs which showed that two high peaks of absenteeism were occurring annually. One peak occurred in the late fall or early winter. Following discussion with the medical staff, the committee concluded that this late fall rise in absenteeism was due to colds and other respiratory infections. On the basis of this information, the problem of colds was selected as the health topic for the December 1953 health bulletin.

This special bulletin pointed out the high prevalence of colds, then briefly explained the common cold and how it is spread. It outlined the importance of prevention and the several steps to be followed in treatment.

Discussion of the bulletin topic was coordinated with the showing of a film (6), "How to Catch a Cold." About 125 showings of the film were given at monthly meetings throughout the plant to a total audience of more than 3,000. Posters in sets of six were also provided with the film and were displayed throughout the

plant. By changing the posters each week, interest in the film and health topic was maintained over a period of 6 weeks.

Another special campaign concerned the problem of overweight and weight control. After a community survey showed that 27 percent of the group studied was overweight and that 12 percent could be classified as "dangerously obese," the committee requested a study of plant personnel. A check of a sample group revealed that 44 percent were at least 10 percent overweight and that 20 percent exceeded their ideal weight by 20 percent or more.

This information prompted the committee's decision to make overweight the next monthly health topic. A film (7), "Losing to Win," was made available for the safety and health meetings, and again posters were displayed. Communitywide coverage for the overweight campaign was arranged by enlisting the aid of the community health council. A series of special articles was written for the local press, and several radio broadcasts, including a 30-minute panel discussion, were arranged.

Other Health Education

The plant medical program at the Hanford Atomic Products Operation presents many additional opportunities for health education. These opportunities are utilized to varying degrees and will be listed here as a further indication of what can be done in the way of health education in industrial organizations. It must be said, however, that every plant will have a program which is highly individual, based on such factors as type of personnel available, extent of medical services and facilities, plant size, management enthusiasm, and other related conditions.

The first opportunity for health education of the worker is at the time he receives his pre-placement physical examination. This initial contact with health education, followed by the periodic physical examinations, indirectly impresses upon the employee the importance of continuous medical supervision. Through these contacts, he gains a respect for medical personnel (or the opposite, depending on how

he is handled) and is guided toward wholesome consideration of his health. This experience may be made more effective by personal counseling and interpretation of the medical findings to each individual, regardless of his present physical status.

The orientation of all new employees offers another good opportunity to promote health education. Here the worker is introduced to plant facilities and procedures. A block of time during this training at the Hanford plant is devoted to a description and explanation of the company's medical facilities and medical services program. Also, a booklet which describes the industrial medical program is given to the incoming employee.

The industrial nurses are key persons in health education. Because of their position, they see employees at times when their advice will be most willingly accepted. The employee who is having trouble, whatever it may be, and goes to the nurse accepts her at once as a person with the knowledge and skill necessary to help him. He is interested in specific help and will be receptive to her advice. Consequently, he is well disposed toward whatever she may have to say to him. Of course, when these conditions are satisfied, learning becomes more effective.

A plant policy requires that employees report to the first aid station for permission to return to work after illness. Here again, the industrial nurse has an opportunity to offer effective health counseling at a most advantageous time.

Employees with a high frequency of absences or accidents are interviewed by industrial physicians; their purpose is to give assistance in situations which may require medical attention. This program was instituted as the result of studies initiated by the health activities committee.

Throughout the plant there are information racks which contain booklets of interest to all workers. Many booklets on health topics, when they are available, are distributed by means of these racks. Information and bulletin boards are available at 150 locations throughout the plant.

Summary

Health education is essential in most modern industrial health and medical programs. At the Hanford Atomic Products Operation, a plant operated at Richland, Wash., for the Atomic Energy Commission by the General Electric Company, a health activities committee with wide employee representation has been organized to carry out an effective health education program. The committee offers an opportunity to gain wide support for health education activities.

In the health education plan described in this report, a monthly health bulletin is published and distributed to all workers. Health and safety meetings are held once a month, at which time the topic of the health bulletin is discussed. Films, speakers, and special programs are arranged. Other opportunities for health education include preplacement and periodic physical examinations, an information program, information racks, and all visits to the industrial nurses and the first aid stations.

Conclusions

The directors of the Hanford medical staff believe that the health education activities contribute materially to the benefits achieved by the overall health and medical program. Over the last 5 years, absenteeism because of sickness has averaged 3.9 days per male employee and 7.4 days per female employee. The best national estimates for industry are 8 days for male employees and 12 days for female employees (8).

That these benefits, when combined with other favorable health and medical programs, extend beyond the confines of the plant is evident in many factors. For example, the average hospital stay in the single industry community of Richland is 5.3 days. The State of Washington average is 38 percent higher. The death rate in Richland, after correction, is one-half the expected death rate (9).

Experience with the work of the health activities committee has revealed a number of advantages in having a planning group which represents the employees:

The committee provides a means of expression

for all plant employees, through their representatives, and the assurance that their health problems will be considered.

The committee has the opportunity to study and correct real health problems; this would be difficult to do without such a group.

The committee can maintain a continuous health education program and follow up its efforts.

The group provides a medium through which the cooperation of other agencies may be obtained.

Contact with the employees is maintained, so that the effectiveness of the health education program may be judged and weaknesses may be noted.

The interest of committee members in promoting good health among all their contacts is assured.

Plantwide representation assures the consideration of broad interests and varied viewpoints.

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Milk Sanitation Honor Roll for 1952-54

Forty-five communities have been added to the Public Health Service milk sanitation "honor roll" and 65 communities on the previous list have been dropped. This revision covers the period from July 1, 1952, to June 30, 1954, and includes a total of 285 cities and 68 counties.

Communities on the "honor roll" have complied substantially with the various items of sanitation contained in the Milk Ordinance and Code Recommended by the United States Public Health Service. The State milk sanitation authorities concerned report this compliance to the Public Health Service. The rating of 90 percent or more, which is necessary for inclusion on the list, is computed from the weighted average of the percentages of compliance. Separate lists are compiled for communities in which all market milk sold is pasteurized, and for those in which both raw milk and pasteurized milk is sold.

The recommended milk ordinance, on which the milk sanitation ratings are based, is now in effect through voluntary adoption in 406 counties and 1,573 municipalities. The ordinance also serves as the basis for the regulations of 34 States and 2 Territories. In 11 States and the 2 Territories it is in effect statewide.

The ratings do not represent a complete measure of safety, but they do indicate how closely a community's milk supply conforms with the standards for grade A milk as stated in the recommended ordinance. High-grade pasteurized milk is safer than high-grade raw milk because of the added protection of pasteurization. The second list, therefore, shows the percentage of pasteurized milk sold in a community which also permits the sale of raw milk.

Although semiannual publication of the list is intended to encourage

This compilation is from the Division of Sanitary Engineering Services of the Bureau of State Services, Public Health Service. The previous listing was published in Public Health Reports, March 1954, pp. 327-330. The rating method was described in Public Health Reports 53: 1386 (1938). Reprint No. 1970.

communities operating under the recommended ordinance to attain and maintain a high level of enforcement of its provisions, no comparison is intended with communities operating under other milk ordinances. Some communities might be deserving of inclusion, but they cannot be listed because no arrangements have been made for determination of their ratings by the State milk sanitation authority concerned. In other cases, the ratings which were submitted have lapsed because they were more than 2 years old. Still other communities, some of which may have high-grade milk supplies, have indicated no desire for rating or inclusion on this list.

The rules for inclusion of a community on the "honor roll" are:

1. All ratings must be determined by the State milk sanitation authority in accordance with the Public Health Service rating method, which is based upon the grade A pasteurized milk and the grade A raw milk requirements of the Public Health Service milk ordinance. (A departure from the method described consists of computing the pasteurized milk rating by weighting the pasteurization plant rating twice that of the raw milk intended for pasteurization.)
2. No community will be included in the list unless both its pasteurized milk and its retail raw milk ratings are 90 percent or more. Communities in which only raw milk is sold will be included if the retail raw milk rating is 90 percent or more.
3. The rating used will be the latest submitted to the Public Health Service, but no rating will be used which is more than 2 years old. (In order to promote continuous rigid enforcement rather than occasional "cleanup campaigns," it is suggested that when the rating of a community on the list falls below 90 percent, no resurvey be made for at least 6 months. This will result in the removal of the community from the subsequent semiannual list.)
4. No community will be included on the list whose milk supply is not under an established program of official routine inspection and laboratory control provided by itself, the county, a milk control district, or the State. (In the absence of such an official program there can be no assurance that only milk from sources rating 90 percent or more will be used continuously.)
5. The Public Health Service will make occasional check surveys of cities for which ratings of 90 percent or more have been reported by the State. (If the check rating is less than 90 percent, but not less than 85, the city will be removed from the 90-percent list after 6 months unless a resurvey submitted by the State during this probationary period shows a rating of 90 percent or more. If the check rating is less than 85 percent, the city will be removed from the list immediately. If the check rating is 90 percent or more, the city will be retained on the list for 2 years from the date of the check survey, unless a subsequent rating during this period warrants its removal.)

Communities Awarded Milk Sanitation Ratings of 90 Percent or More, July 1952-June 1954

100 PERCENT OF MARKET MILK PASTEURIZED

Community	Date of rating	Community	Date of rating	Community	Date of rating
<i>Alabama</i>					
Auburn	9-24-1953	Calumet regions	6-12-1953	<i>Indiana—Continued</i>	
Birmingham-Jefferson County	7-26-1952	Gary			
Gadsden-Etowah County	8-8-1952	East Chicago			
Arkansas		Hammond			
Fort Smith	10-18-1952	Cooperative grade A milk program	9-1952	<i>Kentucky—Continued</i>	
<i>Colorado</i>					
Colorado Springs	1-20-1954	Crawfordsville	10-2-1953	Newport and Campbell County	11-3-1953
Denver	11-3-1953	Edinburg	12-1953	Owensboro and Davies County	8-6-1952
Grand Junction and Mesa County	4-1954	Elkhart	11-1952	Owenton and Owen County	4-2-1953
Las Animas-Huerfano Counties	3-9-1954	Evansville	6-30-1953	Paducah and McCracken County	8-18-1953
Weld County	11-25-1953	Fort Wayne	10-1952	Pendleton County	4-2-1953
<i>District of Columbia</i>					
Washington	3-15-1954	Franklin	12-1953	Williamstown and Grant County	4-2-1953
<i>Florida</i>					
Pinellas County	1-29-1953	Huntington	9-25-1953	<i>Mississippi</i>	
<i>Georgia</i>					
Albany	5-28-1953	Indianapolis	10-31-1952	Aberdeen	10-7-1953
Athens	4-16-1953	Lebanon	6-1953	Amory	10-7-1953
Atlanta	10-17-1953	Madison	7-2-1954	Booneville	9-9-1953
Augusta-Richmond County	10-30-1953	Martinsville	11-20-1953	Brookhaven	3-4-1954
Bainbridge	8-6-1953	Mount Vernon	1-16-1953	Canton	10-1-1952
Cairo	12-18-1952	Muncie	1-28-1953	Clarksdale	9-25-1952
Calhoun, Gordon County	8-11-1953	Nappanee	11-1953	Cleveland	9-3-1952
Camilla	11-18-1952	New Castle	2-1953	Columbia	7-17-1952
Columbus	2-23-1953	Peru	8-27-1952	Columbus	3-26-1954
Elberton	2-9-1954	Richmond	5-15-1953	Corinth	6-11-1953
La Grange	3-18-1953	Rushville	6-1953	Greenville	8-25-1952
Quitman	4-9-1953	Shelbyville	8-1952	Houston	5-28-1953
Savannah	8-15-1952	Tell City	11-5-1953	Iuka	7-9-1953
Swainsboro, Emanuel County	5-5-1954	Valparaiso	7-31-1952	Louisville	9-16-1953
Tifton	6-18-1953	Vincennes	9-4-1953	Natchez	12-17-1952
Waycross	2-4-1954	<i>Iowa</i>		Okolona	5-28-1953
<i>Idaho</i>					
Moscow	9-1953	Des Moines	8-12-1953	Tupelo	4-8-1953
<i>Indiana</i>					
Anderson	6-18-1953	Dubuque	11-14-1952	Winona	11-24-1953
Bedford and Orleans	8-4-1953	Marshalltown	1-29-1953	<i>Missouri</i>	
Berne	3-3-1953	Mason City	10-3-1952	Kansas City	12-5-1952
Bloomington	11-26-1952	Sioux City	9-18-1953	Lebanon	2-13-1953
Bluffton	3-6-1953	Waterloo	10-7-1953	North Kansas City	12-5-1952
<i>Kentucky</i>					
Bowling Green	1-7-1954	Dodge City	4-20-1953	St. Joseph	7-16-1953
Frankfort and Franklin County	7-23-1953	Hillsboro	11-7-1952	St. Louis	12-10-1953
Fulton County	1-21-1954	<i>Kansas</i>		Springfield	3-2-1954
Hickman	1-20-1954	Bowling Green	1-7-1954	Warrensburg	12-5-1952
Hopkinsville	12-10-1953	Frankfort and Franklin County	7-23-1953	<i>Nebraska</i>	
Louisville and Jefferson County	4-7-1954	Fulton County	1-21-1954	Grand Island	9-18-1952
Morgantown	1-8-1954	Hickman	1-20-1954	<i>North Carolina</i>	
Murray	4-29-1954	Hopkinsville	12-10-1953	Alleghany County	9-10-1952
		Louisville and Jefferson County	4-7-1954	Avery County	1-15-1954
		Morgantown	1-8-1954	Burke County	1-15-1954
		Murray	4-29-1954	Charlotte	1-4-1954
				Chatham County	11-19-1953
				Clay County	10-27-1953
				Craven County	2-12-1954
				Davie County	10-1-1952
				Durham County	7-18-1952

Communities Awarded Milk Sanitation Ratings of 90 Percent or More, July 1952-June 1954—Con.

100 PERCENT OF MARKET MILK PASTEURIZED

Community	Date of rating	Community	Date of rating	Community	Date of rating
<i>North Carolina—Continued</i>					
Edgecombe County (excluding Rocky Mount)	7-16-1952	Decherd	10-17-1952	Victoria	7-24-1952
Forsyth County	7-16-1952	Dyersburg	10-23-1952	Waxahachie	9-30-1952
Granville County	7-21-1953	Fayetteville	6-2-1953	Weslaco	2-25-1953
Guilford County	8-6-1952	Gallatin	7-8-1953	Wichita Falls	4-6-1954
Henderson-Transylvania Counties	2-18-1954	Johnson City	8-27-1952	<i>Utah</i>	
Iredell County	10-25-1952	Kingsport	10-8-1953	Ogden	11-10-1953
Lee County	11-19-1953	Knoxville	8-6-1953	Salt Lake City	3-30-1954
Mitchell County	10-23-1953	Lebanon	8-1-1952	Utah County	6-10-1953
Nash County (excluding Rocky Mount)	9-17-1953	Manchester	10-17-1952	<i>Virginia</i>	
New Hanover County	5-28-1954	Memphis	3-25-1954	Abingdon	11-5-1953
Onslow County	5-6-1953	Murfreesboro	7-2-1953	Blacksburg	8-7-1952
Orange County	6-9-1953	Nashville and Davidson County	10-28-1953	Bristol	11-5-1953
Person County	3-17-1953	Newbern	12-23-1952	Buena Vista	8-4-1953
Pitt County	5-15-1953	Pulaski	6-3-1953	Front Royal	8-7-1953
Rockingham-Caswell Counties	3-12-1954	Sparta	5-5-1954	Lexington	8-4-1953
Rocky Mount	9-8-1953	Spring City	5-14-1953	Luray	8-7-1953
Wilson County	9-18-1953	Springfield	7-6-1953	Marion	11-18-1953
Yadkin County	10-1-1952	Sweetwater	9-16-1952	Narrows	8-8-1952
<i>Oklahoma</i>					
Ardmore	6-19-1953	<i>Texas</i>		Norfolk	5-18-1954
Duncan	1-19-1954	Brenham	4-10-1953	Pearisburg	8-8-1952
Mangum	12-17-1953	Commerce	9-2-1952	Portsmouth	5-18-1954
Oklmulgee	10-13-1953	Corpus Christi	9-27-1952	Pulaski	8-7-1952
Seminole	8-29-1953	Corsicana	8-6-1952	Radford	8-7-1952
Sulphur	2-18-1953	Dallas	1-8-1953	Richmond	4-16-1954
<i>Oregon</i>					
Eugene	6-11-1953	Donna	2-25-1953	Roanoke	9-19-1952
Pendleton	6-19-1953	Edinburg	2-25-1953	South Boston	3-8-1954
<i>South Dakota</i>					
North Hill Unit	7-20-1953	El Paso	10-21-1952	Staunton	11-7-1952
Belle Fourche		Falfurrias	5-5-1953	Suffolk	9-26-1952
Deadwood		Gladewater	7-26-1952	Williamsburg	10-9-1953
Lead		Harlingen	6-1-1953	<i>Washington</i>	
Spearfish		Kerrville	7-31-1952	Bellingham	8-21-1953
Sturgis		Kilgore	7-26-1952	Cowlitz County	7-30-1953
Sioux Falls	10-25-1952	Lufkin	3-9-1953	Everett	6-22-1953
<i>Tennessee</i>					
Athens	7-16-1952	McKinney	2-17-1953	Port Angeles	9-10-1953
Bristol	11-5-1953	Mercedes	2-25-1953	Spokane	9-25-1952
Chattanooga	11-13-1952	Mineral Wells	2-11-1953	Walla Walla	10-15-1953
Clarksville	1-30-1953	Mission	2-25-1953	<i>Wisconsin</i>	
Cleveland	10-1-1952	Mount Pleasant	9-24-1952	Beaver Dam	2-27-1953
Clinton	4-21-1954	Nacogdoches	9-20-1952	Burlington	3-26-1953
Cookeville	6-16-1953	Pampa	4-7-1953	Delavan	3-26-1953
Covington	10-22-1952	Pharr	2-25-1953	Eau Claire	3-5-1953
Cowan	10-17-1952	San Antonio	3-25-1953	Elkhorn	3-26-1953
Dandridge	11-10-1953	San Benito	5-30-1953	Fontana	3-26-1953
		San Juan	2-25-1953	Green Bay	9-17-1953
		Sweetwater	2-10-1953	Lake Geneva	3-26-1953
		Texarkana	7-2-1952	Madison	10-26-1953
		Texas City	1-20-1953	Manitowoc	6-4-1953
		Tyler	2-10-1953	Ripon	2-27-1953
				Sheboygan	6-19-1953
				Tomah	5-6-1953
				Waupun	2-27-1953
				Williams Bay	3-26-1953

Communities Awarded Milk Sanitation Ratings of 90 Percent or More, July 1952-June 1954—Con.

BOTH RAW AND PASTEURIZED MARKET MILK

<i>Community and percent of milk pasteurized</i>	<i>Date of rating</i>	<i>Community and percent of milk pasteurized</i>	<i>Date of rating</i>	<i>Community and percent of milk pasteurized</i>	<i>Date of rating</i>
<i>Alabama</i>		<i>Montana</i>		<i>Tennessee</i>	
Lanett, 97.8	11- 6-1952	Jackson, 98.6	9-11-1952	Alcoa, 99.5	9-17-1952
		Laurel, 93.6	8-13-1952	Dayton, 92.1	5-14-1953
<i>Arkansas</i>		<i>North Carolina</i>		Elizabethhton, 93.6	11-25-1952
Little Rock, 99.3	4-20-1953	Missoula, 99.4	9-1952	Harriman, 98	10-15-1953
<i>Florida</i>		<i>North Carolina</i>		Jackson, 98.6	11- 5-1953
Dade County, 99.99	1- 8-1953	Ashe County, 78.7	9- 9-1952	Kingston, 96	10-14-1953
Manatee County, 99.57	8-21-1953	Buncombe County, 97.8	6-25-1953	Maryville, 99.5	9-17-1952
<i>Georgia</i>		Davidson County, 96.4	7-28-1953	McMinnville, 90	5- 5-1954
Brunswick-Glynn County, 96	11- 6-1952	Haywood County, 95	11- 5-1953	Ripley, 96.9	10-22-1952
Cartersville, 97	12-11-1952	Kings Mountain, 83.8	8-18-1952	<i>Texas</i>	
Gainesville-Hall County, 92.2	4- 9-1954	Lenoir County, 78.4	1-30-1953	Amarillo, 97	5-11-1954
Marietta, 96.2	5- 4-1954	Macon County, 91.5	11- 7-1952	Beaumont, 99.9	8-15-1952
Pelham, 88.8	11-18-1952	Vance County, 91.2	7-22-1953	Brownsville, 96	5-29-1953
Thomasville, 99.5	6-17-1953	Wake County, 99.3	3- 4-1953	Childress, 87	2- 4-1953
Toccoa-Stephens County, 88	4- 9-1954	Wilkes County, 91.9	9- 2-1953	Cleburne, 95.5	7-31-1952
Washington-Wilkes County, 99	9-24-1953	<i>Oklahoma</i>		Greenville, 98	9-27-1952
Winder, 97.9	1-23-1953	Ada, 87	7- 8-1953	Laredo, 80	9-18-1952
<i>Kentucky</i>		Elk City, 99	4-17-1953	Longview, 99.4	7-26-1952
Princeton and Caldwell County, 94.7	6- 1953	Enid, 96.6	3-30-1954	Lubbock, 99	8-25-1952
Somerset, 91	2- 1953	Henryetta, 88	1-16-1953	Marshall, 91	4-26-1954
<i>Louisiana</i>		Hobart, 90	1-23-1953	Paris, 92.6	9-25-1953
Shreveport, 99.9	8- 1952	Lawton, 99	12- 1-1953	<i>Virginia</i>	
<i>Mississippi</i>		Norman, 98	2-19-1954	Harrisonburg, 96	11-12-1952
Hattiesburg, 96	7-31-1952	Oklahoma City, 97.8	9-28-1953	<i>Washington</i>	
		Ponca City, 92.6	2- 4-1954	Seattle-King County, 99.7	6-23-1953
		Shawnee, 98.9	12-17-1953	Tacoma, 99.7	8-13-1952
<i>Oregon</i>		Stillwater, 98	4-29-1953	<i>West Virginia</i>	
				Clay County, 88	9-16-1952
				Nicholas County, 55	9-18-1952

NOTE: In these communities the pasteurized market milk shows a 90-percent or more compliance with the grade A pasteurized milk requirements, and the raw market milk shows a 90-percent or more compliance with the grade A raw milk requirements, of the Milk Ordinance and Code Recommended by the United States Public Health Service.

Note particularly the percentage of the milk pasteurized in the various communities listed. This percentage is an important factor to consider in estimating the safety of a city's milk supply. All milk should be pasteurized, either commercially or at home, before it is consumed.